Ontario Ministry of Transportation
Proposed Regulatory Changes
Vehicle Weight & Dimension Reforms
Phase 3

White Paper

MTO Freight Policy Office
July, 2004

Preface

This paper is intended to facilitate discussion of potential regulatory changes to vehicle weight and dimension laws in Ontario. Proposed changes outlined in this document impact heavy commercial combination vehicles only (tractor semi-trailers and tractor double-trailers). Vehicle purchase or other decisions should not be based on these proposals until the consultation process is complete and any amendments to the Highway Traffic Act or its regulations are finalized.

Allowable weights and dimensions in Ontario are set out in the Highway Traffic Act (HTA). The HTA and associated regulations can be viewed at **http://www.e-laws.gov.on.ca/**. Ontario regulates vehicle weights in kilograms (kg) and dimensions in metres (m). Equivalent imperial measures can be calculated using 39.37 inches per metre and 2.2046 pounds per kilogram.

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1) Purpose of this Document

This document provides an overview of proposed changes to allowable weights and dimensions of heavy commercial vehicles in Ontario relating to Phase 3 of the Vehicle Weight and Dimension Reform (VW&D) Project. These are proposed changes only - vehicle purchase decisions should not be based on these proposals until any amendments to the Highway Traffic Act (HTA) or its regulations are finalized. The document is intended to provide interested persons, companies, organizations and governments an opportunity to comment and participate in these proposed regulatory changes.

Specifically, will the proposed vehicles provide a sufficient range of vehicle configurations and payload capabilities to effectively support Ontario's various industrial sectors and businesses? Are there operational or safety concerns with the vehicles proposed? Are there harmonization issues with neighbouring jurisdictions? Are there infrastructure concerns with the proposed changes? Does the proposed transition schedule impose any undue hardships? Do the proposed rules present compliance or enforcement issues?

2) Overview of Vehicle Weight & Dimension Reforms

Certain truck and trailer configurations, especially those equipped with liftable axles, have been identified as a cause of significant damage to roads and bridges. Lift-axle equipped vehicles are also known to have inherent safety concerns. Recent research shows that these, and many other commercial vehicle configurations, do not meet nationally accepted performance criteria related to vehicle controllability, stability and turnability.

The purpose of VW&D reforms is to cause a migration away from such vehicles to ***Safe, Productive, Infrastructure-Friendly*** **(SPIF)** alternatives. SPIF vehicles are equipped with axles that do not need to be raised for cornering. Just as importantly, the weight on SPIF trailers is automatically and equally distributed over all axles on the trailer. Axle overloading is therefore reduced and pavement wear is minimized. Standards for SPIF vehicles are carefully prescribed in regulation to ensure optimum performance, safety, productivity and infrastructure protection.

It is estimated that 75% of tractor-trailer combinations (single semi-trailers and double trailers) operating on Ontario highways currently meet SPIF standards. The remaining 25% do not meet national performance guidelines and/or cause excessive damage to highway infrastructure.

SPIF vehicle weight and dimension standards are based on bridge and pavement capabilities, and vehicle dynamic performance characteristics. The approach to assess vehicle dynamic performance was originally sponsored and developed by the Canadian Council of Motor Transport Administrators (CCMTA) and the Roads and Transportation Association of Canada (RTAC) in the mid 1980's. A series of computer simulated high-speed and low-speed manoeuvres determines the vehicle's controllability and stability, and whether the vehicle can operate within an acceptable space envelope on the highway.

The VW&D Reform Project has been divided into four phases, with each phase addressing a separate group of vehicles. Phase 1 (non-dump triaxle semi-trailers) and Phase 2 (all dump semi-trailers) have already been implemented as described in Appendix A of this document. Proposed Phase 3 changes (all remaining semi-trailers as well as double trailers) are outlined in this discussion document, with details of proposed changes included in Appendix B. The proposed standards for Phase 1, 2 and 3 SPIF vehicles are detailed in Appendix C. Policy development for Phase 4 (straight trucks and their trailers) will commence once Phase 3 is implemented. Phase 4 will also include a further examination of multi-axle tractors.

The proposed approach for Phase 3 is similar to that used in Phase 2. First, a range of SPIF vehicles needs to be identified and proposed standards established. Second, dates need to be established after which all Phase 3 vehicles must be manufactured to SPIF standards. If not built to SPIF standards, they will be required to operate at significantly reduced weights. And third, a grandfather period needs to be established for existing non-SPIF vehicles, after which weight reductions also apply.

3) Expected Results

Safer highways - proposed SPIF vehicles have been subjected to rigorous performance testing. This testing shows that they have superior control and stability characteristics compared to vehicles they will replace. Drivers of SPIF vehicles will find them 'more forgiving' if a mistake is made or an emergency manoeuvre is necessary. Whether making a normal turn at an intersection, or an emergency high-speed avoidance manoeuvre, it is known that trailers do not follow the same path as the tractor. SPIF vehicles are designed to operate within nationally accepted space envelopes to minimize risk of colliding with other vehicles, pedestrians and roadside objects. Eliminating the use of standard lift-axles on SPIF vehicles in Ontario will avoid the severe overloading of remaining axles and associated risk of component failure.

Less infrastructure damage - vehicles equipped with liftable axles and other non-SPIF vehicles are believed to cause hundreds of millions of dollars of excessive damage to Ontario roads and bridges each year. Some of this damage, such as pavement rutting, is readily apparent. Other types of damage include cumulative stress and fatigue and premature wear of bridges and roads. This shortens their effective life and results in the need for more frequent and costly replacement or rehabilitation. The majority of this avoidable damage is to municipal roads and bridges which account for approximately 80% of Ontario's highway infrastructure.

High level of productivity - although the primary focus of Phase 3 VW&D reforms is safety and infrastructure protection, proposed reforms have been developed so that overall motor transport productivity can be maintained. In cases where opportunities have been identified, productivity improvements have been incorporated into the changes. These include:

- Providing a broad range of SPIF vehicle configurations to meet different operational requirements;
- Introducing the SPIF tri-drive tractor option;
- Allowing all SPIF semi-trailers a maximum length of 16.2m;
- Increasing SPIF A-train maximum box length to 20m;
- Allowing all SPIF vehicles to be equipped with additional lift-axles to optimize payloads between Michigan and Ontario (axles may not be deployed in Ontario);
- Allowing a wider tandem spread on 2 and 3-axle SPIF semi-trailers to improve harmonization with Michigan and other states;
- Increasing tandem and tridem axle weights on SPIF double trailers;
- Increasing the 3,000 kg per tire weight cap to 3,850 kg for longer SPIF vehicles;
- Eliminating the 1,500 kg aggregate gross weight reduction for all SPIF vehicles;
- Reducing the complexity of VW&D rules for SPIF vehicles.

Less complex VW&D rules - Ontario's existing VW&D regime is extremely complex. Approximately 40% of tractor-trailer combinations operating on Ontario highways are subject to Regulation 32/94 and meet proposed SPIF standards. The remaining 60% operate under much more permissive rules outside of this regulation. The result is a dualistic system where almost half the vehicles operate under one set of rules, and the rest under a significantly different set.

It is expected that, once the VW&D reform transition is complete, more than 95% of tractor-trailer combinations will meet SPIF standards. The vast majority of these vehicles will therefore be operating under a single set of more straightforward, consistent rules. The resulting improvements to compliance and enforceability will further contribute to safety and infrastructure protection.

4) VW&D Reforms - Consultation Process

Before commencing meaningful consultations with shippers, carriers and other interested parties, MTO determined that there was a need to conduct technical research to understand the numbers, types and characteristics of multi-axle vehicles currently operating on Ontario highways. There was also a need to explore potential alternative vehicles from a technical feasibility, safety and infrastructure standpoint.

In March, 2003, MTO awarded a research contract to the National Research Council of Canada, Centre for Surface Transportation Technology (NRC/CSTT)[1]. A steering committee to oversee this project was made up of representatives from MTO, Transport Canada, the Canadian Transportation Equipment Association (CTEA) and the Forestry Engineering Research Institute of Canada (FERIC).

The project included an examination of semi-trailers with 5 or more axles currently operating on Ontario highways as well as development of a list of candidate alternative configurations designed to satisfy safety, productivity and infrastructure-protection goals. NRC/CSTT was also asked to examine the application and experience of self-steer axle technology, drive options for four-axle tractors, and the need for a self-steer axle cab lift control to improve drive-traction.

A primary focus of the project was to undertake an assessment of existing dynamic control, stability and turnability performance measures as well as to develop other appropriate tests and measures. The identified existing vehicles and variations of the candidate vehicles were then subjected to computer simulations to determine their performance characteristics.

Results of analysis and computer simulations narrowed the list of candidate alternatives and determined that further full-scale testing of two 5-axle semi-trailer configurations is necessary to verify the computer simulation results and to address outstanding performance questions. NRC/CSTT was subsequently asked to develop detailed plans and procedures for a full-scale test project, which has also been completed. It is expected that the recommended full-scale testing will take place in the spring or summer of 2004.

Based on the NRC/CSTT project, other existing research, and in-house analysis undertaken by MTO, it is now possible to specify proposed Phase 3 changes so that they can be examined by all interested stakeholders. All feedback and concerns will be carefully examined within the context of infrastructure protection, productivity, vehicle performance characteristics and other safety issues, and regime complexity. All efforts will be made to address concerns where it is possible to make adjustments within the above mentioned parameters.

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[1] National Research Council of Canada, Centre for Surface Transportation Technology (NRC/CSTT) reports titled "Performance of Infrastructure-Friendly Vehicles", October 23, 2003 and "Test Program to Assess the Dynamic Performance of Infrastructure-Friendly Vehicles", October 30, 2003 can be downloaded from the following website: http://www.ctca.on.ca/weight&dim.htm - ON

5) Highlights of Phase 3 Proposals *(see Appendix B for details)*

5.1) Introduce SPIF Tri-Drive Tractors: Tri-drive tractors may be used in combination with 1 to 4-axle SPIF semi-trailers (including those up to 16.2m long):

- To meet accepted performance standards:
  - longer tractor wheelbase is required - 6.6 to 6.8m;
  - longer overall length is allowed - 23.5m;
  - trailer wheelbase is restricted - 12.0m;
  - minimum weight on front axle is established - 27% weight on drives.

5.2) Introduce SPIF 5-Axle Semi-Trailers: Introduce two 5-axle semi-trailers up to 16.2m long as primary replacements for existing semi-trailers with 5 or more axles:

- Each trailer must be equipped with a tridem axle plus two self-steering axles;
- Two axle configurations available:
  - shorter wheelbase 1-3-1;
  - longer wheelbase 1-1-3.
- All trailer axles must load-equalize. Maximum weight on each axle is 7,500 kg;
- Rearmost axle of 1-3-1 must have an automatic locking device that engages at higher speeds;
- Semi-trailers may be equipped with additional lift-axles for use outside Ontario.

5.3) Introduce SPIF Double Trailers: Apply existing HTA Regulation 32/94 rules to all SPIF A, B and C-train doubles:

- Box length requirements are the same for A, B and C-train doubles;
- Gross weight restrictions are extended to all SPIF A and C-trains;
- Gross weight incentives are extended to all SPIF B-trains;
- Trailers may be equipped with additional lift-axles for use outside Ontario.

5.4) Standardize SPIF Tractor Wheelbase Maximum: Apply HTA Regulation 32/94 tractor specification rules to all SPIF vehicle combinations other than those specified as tri-drive:

- Rules include:
  - maximum wheelbase 6.2m;
  - minimum interaxle spacing 3.0m;
  - single or tandem drive. Allowable tandem spread 1.2 to 1.85m;
  - may not have additional lift or self-steer axles.
- Existing rules continue to apply to all tractors with SPIF semi-trailers longer than 14.65m, or double trailers longer than 23m or with box length greater than 18.5m;
- Rules will be extended to other SPIF combinations starting with 2006 model year tractors.

5.5) Standardize SPIF Semi-Trailer Length Maximum: Standardize maximum SPIF semi-trailer length, but limit length of end-dump box:

- Maximum length for any SPIF semi-trailer is 16.2m;
- End-dump box length is restricted to 14.65m.

5.6) Harmonize SPIF Semi-Trailer Axle Spreads with Michigan: Standardize the maximum tandem axle spread for SPIF fixed axle and Self-Steer Triaxle semi-trailers:

- Tandem axle spreads of SPIF fixed axle and Self-Steer Triaxle - 1.2 to 2.8m;
- If Self-Steer Triaxle tandem spread is more than 1.85m, self-steer axle must be equipped with an automatic locking device that engages above a specified speed.

5.7) Standardize Internal Dimensions of SPIF Semi-Trailers: Apply HTA Regulation 32/94 semi-trailer specifications to all SPIF semi-trailers, including:

- Kingpin setback so swing radius does not exceed 2m;
- Semi-trailer wheelbase limits - 6.25 to 12.5m (6.25 to 12.0m if tri-drive tractor);
- Inter-axle spacing minimums;
- Tandem and tridem axle spread allowances;
- Track width must be 2.5 to 2.6m if trailer is wider than 2.5m;
- Effective rear overhang not to exceed 35% of wheelbase.

5.8) Standardize SPIF Axle Weights: Extend axle weight increases provided to single semi-trailers in Phase 1 to SPIF double trailers as identified in Phase 3:

- Axle weights allowed on SPIF double trailers:
  - 1.2 < 1.6m tandem - 18,000 kg.
  - 3.0 < 3.1m tridem - 24,000 kg (in 2006).

5.9) Standardize Weight Cap on Axles with Single Tires: Establish a common maximum weight per tire for all SPIF vehicles:

- Any tire on a SPIF vehicle is limited to 3,850 kg (effectively 7,700 kg per single tire equipped axle);
- The self-steer axles of SPIF vehicles equipped with single tires are exempt:
  - Self-Steer Triaxle - maximum 9,000 kg;
  - Self-Steer Quad (3.0 < 3.6m tridem) - maximum 8,000 kg;
  - Self-Steer Quad (3.6 to 3.7m tridem) - maximum 8,500 kg.

5.10) Standardize Rules for Self-Steer Axles (when required on SPIF Vehicles):

- Self-steer axles may be lifted:
  - when vehicle is reversing;
  - if remaining axles are within legal weight limits;
  - when vehicle is not on a public roadway.
- Lift controls must be located on the trailer. Axle may not be controlled from the tractor.
- May have a self-contained device on the trailer that automatically lifts the axle(s) when vehicle is reversing.
- Axles must meet specified minimum wheel turn requirements. (Note: In some applications, a greater wheel cut than minimum specified may be desirable.)
- In certain cases, self-steer axles are required to be equipped with a locking device which automatically engages at higher speeds.
- Self-steer axles must automatically load-equalize with other axles on the semi-trailer when on an Ontario highway.

5.11) Allowance for Additional Lift-Axles on SPIF Vehicles:

- SPIF semi-trailers and double trailers may be equipped with additional lift-axles for use in other jurisdictions to harmonize gross weight allowances, or for use in heavy haul applications.
  - Axles may not be deployed in Ontario or add to Ontario gross weight allowances, unless authorized by a valid O/O permit.
  - Lift controls may be located in cab of tractor.
- Tractors of SPIF vehicles identified to-date may not be equipped with any axles other than a single front steering axle combined with single, tandem or tridem drive axles.

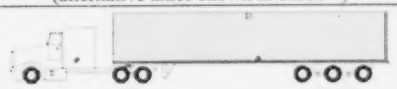
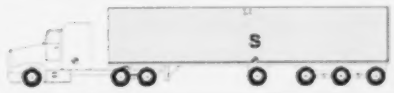
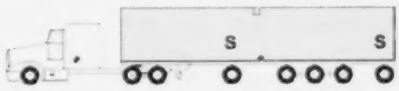
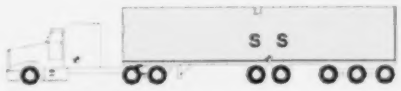
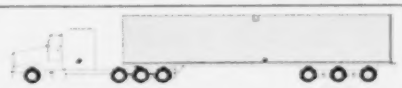
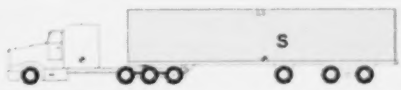
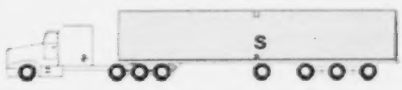
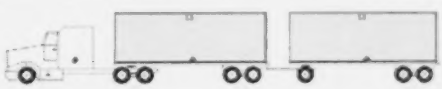
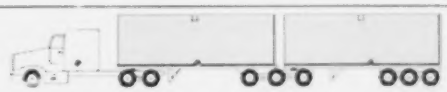
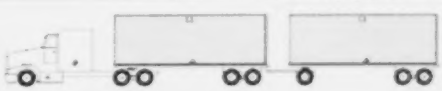
5.12) Standardize Gross Weight Calculation for SPIF Vehicles:

- All SPIF vehicles are exempt from special GVW calculation and 1,500 kg reduction that otherwise applies to vehicles when carrying aggregate product. (Phase 1 and 2 SPIF vehicles were previously exempted. Note: Exemption only applies to vehicles meeting all SPIF standards.)

5.13) Treatment of Non-SPIF Vehicles:

- Phase 1 non-SPIF GVW reductions expanded to include 1 and 2-axle non-dump semi-trailers. These reductions are scheduled to commence in 2006 and currently only apply to 3-axle non-dump semi-trailers.
- All vehicles identified as 'long' in Appendix C (ie. semi-trailers > 14.65m; double trailers overall length > 23m or box length > 18.5m) must meet all SPIF standards or will be considered as overlength non-SPIF vehicles.
- All Phase 3 vehicles (non-dump semi-trailers with 4 or more axles and double trailers) identified in Appendix C and manufactured after 2005 must be built to SPIF standards or operate at significantly reduced weights.
- Grandfather provisions will apply to non-SPIF Phase 3 vehicles built prior to 2006.

6) Phase 1, 2 and 3 Existing and Proposed SPIF Vehicles *(see Appendix C for details)*

SPIF Vehicle	Description (VW&D Reforms Phase)	Schematic (alternative axles shown in shadow)
#1	**Fixed-Axle Semi-Trailer:** **- single axle** **- tandem axle** **- tridem axle** (Phase 1, 2, 3)	
#2	**Self-Steer Triaxle Semi-Trailer** (Phase 1, 2)	
#3	**Self-Steer Quad Semi-Trailer** (Phase 1, 2)	
#4	**5-Axle Self-Steer Semi-Trailer (1-3-1)** (Phase 3)	
#5	**5-Axle Self-Steer Semi-Trailer (1-1-3)** (Phase 3)	
#6	**Tri-Drive Tractor** **Fixed Axle Semi-Trailer** (Phase 3)	
#7	**Tri-Drive Tractor** **Self-Steer Triaxle Semi-Trailer** (Phase 3)	
#8	**Tri-Drive Tractor** **Self-Steer Quad Semi-Trailer** (Phase 3)	
#9	**A-Train Double** (Phase 3)	
#10	**B-Train Double** (Phase 3)	
#11	**C-Train Double** (Phase 3)	

7) Phase 3 Weight Reductions for Non-SPIF Vehicles *(see Summary Table next page)*

7.1) Phase 3 <u>non-SPIF</u> vehicles include:

- Single semi-trailers with 4 or more deployed axles (other than end-dumps or open-top hopper dumps) that do not meet standards for SPIF Vehicles #3, 4, 5 or 8 as specified in Appendix C;
- Double trailer combinations that do not meet standards for SPIF Vehicles #9, 10 or 11 as specified in Appendix C.

7.2) Reductions from allowable gross weight for Phase 3 non-SPIF vehicles:

- If vehicle or combination is equipped with up to one deployed lift axle - the reduction from allowable GVW is 4,500 kg; or
- If vehicle or combination is equipped with two or more deployed lift axles, or is an A or C-train double - the reduction from allowable GVW is 9,000 kg.

7.3) When reductions apply:

- Effective January 1, 2006 - any Phase 3 non-SPIF trailer built after 2005;
- Effective January 1, 2016 - any Phase 3 non-SPIF trailer, including those built prior to 2006;
- Effective January 1, 2016 - any Phase 3 non-SPIF trailer that has not reached 15 years of age from date of original manufacture (20 years if trailer is a liquid or dry bulk tanker), is exempt from the above GVW reductions until the vehicle reaches 15 years of age (20 years if vehicle is a liquid or dry bulk tanker). This will require the operator to obtain a special annual permit*.

  <u>Example</u>: a 5-axle non-SPIF flat bed trailer with 2 lift axles built in June, 2004 could operate without weight reduction until December 31, 2015 - at which time it would be 11½ years old. The operator could then obtain annual permits to continue operations without weight reduction for an additional 3½ years until June, 2019. At that time, or if the operator chose not to obtain an annual permit, the vehicle's allowable gross weight would be reduced by 9,000 kg. If the same trailer had been manufactured in 1994, it would be able to operate without weight reduction until December 31, 2015 - after which its allowable gross weight would be reduced by 9,000 kg.

  * <u>Note</u>: to be eligible for special annual permits, carrier must have and maintain a Carrier Safety Rating that is 'Excellent', 'Satisfactory' or 'Satisfactory-Unaudited'.

8) Non-SPIF Gross Weight Reductions (including Phase 1, 2 and 3 reductions)

How to use this chart:

1) start at top left
2) move down left column until vehicle description is found.
3) move across that row to determine dates and changes to GVW.

Vehicle	July 1 2002	Jan 1 2003	Phase 3 Implementation	Jan 1 2006	Jan 1 2011	Jan 1 2016	Jan 1 2021
SPIF vehicles[1] (Phase 1, 2, 3)	Aggregate GVW calculation and 1500 kg reduction no longer apply to Phase 1 and 2 SPIF vehicles	exempt from GVW reductions listed below	Aggregate GVW calculation and 1500 kg reduction no longer apply to Phase 3 SPIF vehicles	exempt from GVW reductions listed below	exempt from GVW reductions listed below	exempt from GVW reductions listed below	exempt from GVW reductions listed below
Non-SPIF end-dump and open-top hopper dump semi-trailers (Phase 2)		4500 kg** GVW reduction if built after 2002.			4500 kg** GVW reduction also applies to vehicles built prior to 2003[2]		
Non-SPIF 1, 2, 3 axle specialized[3] **tankers** (Phase 1)							4500 kg GVW reduction
Non-SPIF 1, 2, 3 axle non-specialized[4] **tankers** (Phase 1)				3000 kg GVW reduction			GVW reduction increases to 4500 kg
All other non-SPIF 1, 2, 3 axle semi-trailers (Phase 1)				3000 kg GVW reduction	GVW reduction increases to 4500 kg		
Non-SPIF semi-trailers with 4 or more axles, and non-SPIF double trailers (Phase 3)				4500 kg*** GVW reduction if built after 2005.		4500 kg*** GVW reduction also applies to vehicles built prior to 2006[5]	

** Reduction is 9,000 kg if vehicle combination has 2 or more deployed lift-axles[6].
*** Reduction is 9,000 kg if vehicle combination has 2 or more deployed lift-axles, or is an A or C-train double.

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[1] Phase 1 and 2 SPIF Vehicles include SPIF # 1-3 as detailed in Appendix C.
Phase 3 SPIF Vehicles include SPIF #4-11 as detailed in Appendix C.

[2] End-dumps built in the years 1996 through 2002, and open-top hopper dumps built in the years 1991 through 2002, are eligible for special annual permits exempting them from this weight reduction until they reach the age of 15 or 20 years respectively.

[3] Specialized 3-Axle Tankers include single triaxle semi-trailers that are: a carbon dioxide tank semi-trailer; a cryogenic tank semi-trailer; or a tag-axle tank semi-trailer

[4] Non-Specialized 1, 2 and 3-Axle Tankers includes liquid and dry bulk tank triaxle single semi-trailers other than those listed above as Specialized.

[5] It is proposed that all body styles other than dry or liquid bulk tankers built in the years 2001 through 2005, and dry and liquid bulk tankers built in the years 1996 through 2005, are eligible for special annual permits exempting them from this weight reduction until they reach the age of 15 or 20 years respectively.

[6] Definition of lift-axle includes any axle that is equipped with a device for altering the weight transmitted to the highway surface, or that is able to lift its tires from contact with that surface. (HTA Section 114)

9) Submission of Comments or Presentations

9.1) Comments

Written comments in the form of an e-mail, letter or full submission may be sent to the Project Leader as follows:

Ron Madill - Project Leader
VW&D Reform Project
Freight Policy Office
Ministry of Transportation, Ontario
Building B - 3rd floor
1201 Wilson Avenue
Downsview, Ontario M3M 1J8

email: ron.madill@mto.gov.on.ca
phone: (519) 473-6543
fax (416) 235-4850

9.2) Presentations or Meetings

Those wishing to meet with Ministry staff, or make oral presentations concerning the proposed changes, should contact the Project Leader.

9.3) Deadline

Deadline for submissions is October 31, 2004.

APPENDIX A - Phase 1 and 2 Changes

A-1) VW&D Reforms, Phase 1 - effective January 1, 2001

- SPIF vehicles are identified as:
  - single axle single semi-trailers
  - tandem axle single semi-trailers
  - tridem axle single semi-trailers
  - self-steer triaxle single semi-trailers
  - self-steer quad single semi-trailers

- Allowable weight on tandem axle spreads of 1.2 < 1.6m increased to 18,000 kg on the following vehicles: (see HTA Reg 597 Section 9)
  - standard 3-axle tractors;
  - single semi-trailer operating only on tandem axle;
  - the tandem axle of a self-steer triaxle single semi-trailer.

- Allowable axle weight of single semi-trailer operating only on tridem axle is increased as follows: (see HTA Reg 597 Section 11)
  - spreads of 3.0 < 3.6m - increased to 24,000 kg effective January 1, 2006
  - spreads of 3.6 to 3.7m - increased to 25,500 kg effective January 1, 2001
    - increased to 26,000 kg effective January 1, 2006

- Standards for Self-Steer Triaxle Semi-Trailer described in regulation: (see HTA Reg 597 Section 4)

- Standards for Self-Steer Quad Semi-Trailer described in regulation: (see HTA Reg 597 Section 5)

- A new class of Special Permit for vehicles with weights or dimensions in excess of HTA limits was introduced. (See HTA Section 110.1 to 110.4) Special Permits may be issued only under tightly defined circumstances, and are distinct from regular Overweight / Overdimensional Permits which may be issued in cases where the load or vehicle is indivisible.

- Introduction of an additional fine for improper use of a lift-axle. (see HTA Section 125)

- Phase 1 <u>non-SPIF</u> vehicles include:

  - 3-axle single semi-trailers, that are not SPIF vehicles and that are not end-dump or open-top hopper dump semi-trailers;

  - 1 and 2-axle single semi-trailers, that are not SPIF vehicles and that are not end-dump or open-top hopper dump semi-trailers (proposed modification).

- The gross weight of all Phase 1 non-SPIF vehicles will be reduced in two steps as follows: (see HTA Reg 597 Section 8)

  - effective January 1, 2006 - allowable GVW of all Phase 1 non-SPIF vehicles is reduced 3,000 kg unless vehicle is a highly specialized carbon dioxide tanker, cryogenic tanker or tag-axle tanker (as defined in regulation);

  - effective January 1, 2011 (January 1, 2021 if vehicle is a tanker semi-trailer) - allowable GVW of all Phase 1 non-SPIF vehicles is reduced a total of 4,500 kg;

- Phase 1 example: a 3-axle non-SPIF dry-bulk tanker semi-trailer built any time could operate without weight reduction until January 1, 2006 - at which time the allowable GVW would be reduced by 3,000 kg. It could continue to operate at this reduced weight until January 1, 2021 - at which time the allowable GVW would be reduced a total of 4,500 kg.

A-2) VW&D Reforms, Phase 2 - effective July 1, 2002

- 3-axle open-top hopper dumps are added to Phase 1 list of vehicles exempt from GVW reductions which start in 2006. (see HTA Reg 597 Section 8)
- Standards for the Self-Steer Quad Semi-Trailer are modified to allow a fifth non-deployed lift-axle on the trailer. (see HTA Reg 597 Section 5)
- The five SPIF vehicles (identified in Phase 1) are no longer subject to the special gross weight calculation or the 1,500 kg GVW reduction that otherwise applies to vehicles hauling aggregate. (see HTA Reg 597 Section 1)
- Phase 2 non-SPIF vehicles include:
  - all end-dump and open-top hopper dump single semi-trailers that are not SPIF vehicles (as identified in Phase 1).
- The gross weight of all Phase 2 non-SPIF vehicles will be reduced as follows: (see HTA Reg 597 Section 8)
  - if vehicle or combination is equipped with up to one deployed lift axle - the reduction from allowable GVW is 4,500 kg; or
  - if vehicle or combination is equipped with two or more deployed lift axles - the reduction from allowable GVW is 9,000 kg.
- The above reductions apply as follows: (see HTA Reg 597 Section 8)
  - effective January 1, 2003 - any Phase 2 non-SPIF vehicle built after 2002;
  - effective January 1, 2011 - any Phase 2 non-SPIF vehicle, including those built prior to 2003;
  - effective January 1, 2011 - any Phase 2 non-SPIF vehicle that has not reached 15 years of age from date of original manufacture (20 years if trailer is an open-top hopper), is exempt from the above GVW reductions until the vehicle reaches 15 years of age (20 years if vehicle is an open-top hopper). This will require the operator to obtain a special annual permit.
  - Phase 2 example: a 3-axle non-SPIF end-dump semi-trailer with one lift axle built in June, 2000 could operate without weight reduction until December 31, 2010 - at which time it would be 10½ years old. The operator could then obtain annual permits to continue operations without weight reduction for an additional 4½ years until June, 2015. At that time, or if the operator chose not to obtain an annual permit, the vehicle's allowable gross weight would be reduced by 4,500 kg.

APPENDIX B - Explanation of Proposed Phase 3 Changes

B.1) Introduce SPIF Tri-Drive Tractors (SPIF vehicles #6 - 8)

Current Rules	• Tri-drive tractors may currently operate in Ontario, subject to the following key restrictions: o May not be combined with a Self-Steer Triaxle or Self-Steer Quad semi-trailer. o May not be combined with a semi-trailer longer than 14.65m, or a double trailer combination when overall length exceeds 23m or box length exceeds 18.5m. o Overall length of tractor semi-trailer combination is limited to 23m. • The wheelbase of tractors combined with semi-trailers up to 14.65m is not controlled. The wheelbase of tractors combined with semi-trailers longer than 14.65m is restricted to 6.2m. • The wheelbase of semi-trailers up to 14.65m is not controlled. The maximum wheelbase of semi-trailers longer than 14.65m is 12.5m.
Proposal	• Tri-drive tractors may be used in combination with 1 to 4-axle SPIF semi-trailers (including those up to 16.2m long).
Key Details	• The three driving axles tend to push the tri-drive tractor straight ahead, making it more difficult for the front axle to steer the vehicle around a corner. Extensive testing and field experience points to the need for the following controls to ensure sufficient steerability: o Tractor wheelbase must be 6.6 to 6.8m. o Tri-drive spread restricted to 2.4 to 2.8m. o Front axle weight at least 27% of weight on drives at all times. • The resulting longer wheelbase tractor leads to additional offtracking of the inside trailer wheels. There is therefore a need to restrict the semi-trailer wheelbase to offset the longer tractor wheelbase and maintain acceptable offtracking limits: o Semi-trailer wheelbase restricted to 12.0 m. • A longer overall length of the tractor semi-trailer combination is required to accommodate the longer wheelbase tractor: o Allowable overall length 23.5m.
Productivity Impact	• The tri-drive tractor semi-trailer combination provides better drive traction and a higher allowable gross vehicle weight than a tandem-drive combination. The extra axle capacity of the tractor may make it easier to distribute the load on the trailer, and better accommodates self-loading/unloading devices or additional cargo on the tractor. • When combined with the Self-Steer Quad semi-trailer, this vehicle provides another SPIF alternative to existing 5+ axle semi-trailers. Instead of a fifth axle on the trailer, an additional axle is added to the tractor. This vehicle may be useful in the forestry industry where it is expected to provide better traction, better load distribution and be more suitable for off-road applications than other SPIF vehicles.
Safety Impact	• Provided the above noted restrictions are in place, this vehicle has satisfactory control and stability performance characteristics. In some cases, performance characteristics are superior to tandem drive tractors. • Field tests show that a tri-drive produces 55% better traction than a tandem drive tractor. • The slightly longer overall length of the tri-drive tractor semi-trailer combination is not expected to impact highway safety. This combination is considerably shorter than the 25m maximum allowed for tractor double-trailer combinations.
Infrastructure Impact	• Tri-drive tractor semi-trailer combinations are expected to result in a significant reduction in infrastructure damage compared to multi-axle semi-trailers currently in operation. Axles on the SPIF tri-drive combinations do not need to be raised for cornering, the weight on the trailer is evenly distributed over all trailer axles, and axle spacing and weight distribution more closely match Ontario's Bridge Formula.

B.2) Introduce SPIF 5-Axle Semi-Trailers (SPIF vehicles #4 and 5)

Current Rules	• There is no restriction on the number of axles on semi-trailers up to 14.65m long. There are many 5 and 6-axle semi-trailers and smaller numbers with 7 and 8 axles. These trailers are typically equipped with multiple lift-axles. • Regulations do not allow semi-trailers longer than 14.65m to have more than three axles (none of which may be liftable).
Proposal	• Introduce two 5-axle semi-trailers up to 16.2m long as primary replacements for existing semi-trailers with 5 or more axles.
Key Details	• Multi-axle semi-trailers have a great deal of difficulty negotiating corners because of widely spaced axles. This is usually resolved by lifting one or more of the axles. SPIF vehicles are required to be able to turn corners without raising axles: o Each trailer must be equipped with a tridem axle plus two self-steering axles. • Different axle configurations are desirable as certain applications require different manoeuvring ability: o Allow shorter wheelbase 1-3-1 axle configuration; o Allow longer wheelbase 1-1-3 axle configuration. • Optimum protection of bridges and pavement require sufficient spacing of the axles, weights that accommodate the Ontario Bridge Formula, and automatic load sharing of axles: o Required tridem spread is 3.0 to 3.1m; o Maximum weight on each axle is 7,500 kg (37,500 kg on five axles); o Automatic load-equalization of all trailer axles is required. • Computer simulations indicate that having a self-steer axle at the rear of the semi-trailer can lead to unacceptable performance characteristics at higher speeds: o The rearmost axle of the 1-3-1 semi-trailer must be equipped with an automatic locking device that locks the axle in the straight-ahead position above a specified speed and unlocks it at slower speeds for turning. • While a 5-axle semi-trailer can achieve maximum allowable gross weights in Ontario, additional axles are required to attain similar weights in Michigan: o The semi-trailer may be equipped with one or more additional lift-axles - none of which may be deployed in Ontario.
Productivity Impact	• The two SPIF 5-axle semi-trailers plus the tri-drive tractor self-steer quad semi-trailer are expected to achieve similar payload weights as existing multi-axle semi-trailers. • Vehicles operating between Ontario and Michigan may be equipped with additional lift-axles for deployment in Michigan. These axles optimize the allowable gross vehicle weights in both jurisdictions.
Safety Impact	• Computer simulations show that the overall dynamic performance of the two SPIF 5-axle semi-trailers is superior to existing 5 to 8 axle semi-trailers. Further full-scale testing of the SPIF trailers is planned for the Spring of 2004.
Infrastructure Impact	• The SPIF semi-trailers are expected to result in a significant reduction in infrastructure damage. Axles on the SPIF trailers do not need to be raised for cornering, the weight on the trailer is evenly distributed over all trailer axles, and axle spacing and weight distribution more closely match Ontario's Bridge Formula.

B.3) Introduce SPIF A, B and C Train Doubles (SPIF vehicles #9 - 11)

Current Rules	• A-train doubles over 23m overall length and B and C-train doubles with box length over 18.5m or overall length over 23m are carefully controlled under HTA Regulation 32/94. • Under Regulation 32/94, the allowable GVW of A and C-trains is restricted to encourage the use of B-train combinations which have superior performance characteristics. • Under Regulation 32/94, B and C-trains may have a box length up to 20m. A-trains are restricted to 18.5m. • Outside of Regulation 32/94, all other A, B and C-trains may have any number of axles (and lift-axles) and have very few dimensional limitations - with the primary exceptions that overall length is restricted to 23m and box length to 18.5m. The gross weights of A and C-train doubles are not subjected to specific weight restrictions.
Proposed	• Apply existing HTA Regulation 32/94 rules to all SPIF A, B and C-train doubles. • Continue to apply the 18.5m box length maximum to all double trailer combinations up to 23m overall length. Allow 20m maximum box lengths where double trailer combinations have an overall length greater than 23m up to 25m (including A-trains).
Key Details	• Regulation 32/94 rules closely emulate national standards set out in the national Memorandum of Understanding Agreement on Vehicle Weights and Dimensions (MoU), which were based on dynamic performance criteria developed in the 1986 CCMTA/RTAC VW&D Study. • The CCMTA/RTAC VW&D Study showed that the specifications for double trailers need to be carefully controlled to address high speed performance characteristic deficiencies: o numerous minimum and maximum dimensional limits are applied to the tractors, trailers and dollies making up double combinations; o Allowable axles are restricted to singles, tandems and tridems; o The spread of tandem and tridem axles is carefully controlled. • The CCMTA/RTAC VW&D Study showed the performance characteristics of B-train doubles to be superior to A and C-train doubles. The MoU and Regulation 32/94 provide gross weight restrictions and incentives for these vehicles: o Weight cap restrictions are applied to A and C doubles; o Gross weight incentives are provided to B doubles. • Very wide spread axles or additional numbers of axles are required to achieve gross weight allowances in Michigan that are similar to Ontario's. As the performance characteristics of double trailers do not meet national standards when equipped with wide-spread axles, additional provisions are made for extra lift axles: • The double trailers may be equipped with one or more additional lift-axles - none of which may be deployed in Ontario.
Productivity Impact	• The SPIF B-trains achieve similar gross vehicle weights as are currently available. • A and C trains are better suited to lighter, higher cube movements. Standardizing the SPIF double trailer maximum box length at 20m results in increased harmonization of rules with other provinces and allows additional cubic capacity on the A-train double. • Vehicles operating between Ontario and Michigan may be equipped with additional lift-axles for deployment in Michigan. These axles optimize the allowable gross vehicle weights in both jurisdictions.
Safety Impact	• Computer simulations and testing indicate that double trailers based on CCMTA/RTAC standards have superior control and stability compared to other configurations. • The performance of A and C-train doubles has been shown to deteriorate as GVW is increased. Proposal extends national weight restrictions to all A and C-train doubles. • Increasing the A-train box length to 20m results in improved performance. Research and testing shows that stability and control characteristics of the A-train improve markedly with increases in wheelbase lengths.
Infrastructure Impact	• This change is expected to result in significant infrastructure protection compared to existing double trailers that may be equipped with liftable axles.

B.4) Standardize SPIF Tractor Specifications (SPIF vehicles #1 - 5 and #9 - 11)

Current Rules	• When combined with semi-trailers longer than 14.65m or double trailers with an overall length greater than 23m or B and C-train doubles with a box length greater than 18.5m, tractors are carefully controlled under HTA Regulation 32/94: o Wheelbase may not exceed 6.2m; o Minimum interaxle spacing is 3.0m; o Must have single or tandem drive axles; o Allowable tandem spread is 1.2 to 1.85m; o May not have additional lift or self-steer axles. • None of the above restrictions apply to tractors in combination with semi-trailers up to 14.65m or double trailers with overall length up to 23m.
Proposed	• Apply Regulation 32/94 tractor specifications to all SPIF combinations other than those specified as tri-drive.
Key Details	• Regulation 32/94 rules closely emulate national standards set out in the national Memorandum of Understanding (MoU) Agreement on Vehicle Weights and Dimensions (which were, in turn, based on dynamic performance criteria developed in the 1986 CCMTA/RTAC VW&D Study). • The above rules have applied to longer combinations since 1994 and existing tractors conform to the rules. There are numerous existing tractors in short combinations that do not meet these standards: o The above rules will continue to apply to all tractors in long combinations; o The above rules will apply to tractors in combination with SPIF semi-trailers up to 14.65m and double trailer with overall length up to 23m for tractors of model year 2006 and beyond. The rules will not apply to tractors of model year 2005 and earlier.
Productivity Impact	• These are national standards that apply in all other provinces. This change will better harmonize with all other Canadian jurisdictions. • It is possible to achieve the same axle and gross weights in Ontario with tractors conforming to these rules as with other tractors. • It is recognized that US based tractors do not have a similar tractor specification requirement. If US-based carriers wish to qualify as SPIF vehicles, the above rules must be respected.
Safety Impact	• Extension of Regulation 32/94 rules ensures that SPIF tractors meet accepted national high speed and low speed performance measures. • Low Speed Offtracking (the space taken by the trailer when the vehicle makes a sharp turn) is directly affected by the tractor wheelbase.
Infrastructure Impact	• Vehicles with controlled wheelbases require less turning space and are less likely to interfere with roadside fixtures at intersections.

B.5) Standardize SPIF Semi-Trailer Length Maximum (SPIF vehicles #1 - 8)

Current Rules	• Fixed axle (single, tandem or tridem) semi-trailers may exceed 14.65m length up to 16.2m under carefully controlled provisions of HTA Regulation 32/94. • All other semi-trailer axle configurations are restricted to 14.65m. • In conjunction with Quebec, Ontario allows the Self-Steer Quad semi-trailer to operate at 16.2m under Special Trial Permit.
Proposed	• Allow a maximum length of 16.2m for all SPIF semi-trailers, while restricting box length of end-dump semi-trailers to 14.65m.
Key Details	• Semi-trailers throughout North America operate at 16.2m lengths. Longer semi-trailers tend to have better high speed performance characteristics than shorter trailers. Wheelbase and other dimensions of these trailers are carefully prescribed to ensure that the space occupied while turning is within national standards: o Maximum length for SPIF semi-trailers is 16.2m. • Research shows that the length of the end-dump box is one of a number of factors that can increase the risk of the vehicle tipping over while dumping: o Restrict the box length of end-dump semi-trailers to 14.65m.
Productivity Impact	• Productivity improvements are expected as the 16.2m trailer combines a higher cubic capacity with the weight capacity of the existing 14.65m semi-trailers. • Ontario and Quebec have been allowing the 16.2m self-steer quad semi-trailer by trial permit since 2001. Productivity will be improved if both provinces permanently adopt this harmonized semi-trailer into regulation. • Michigan now allows 16.2m 3-axle semi-trailers. Allowing the Self-Steer Triaxle to operate at 16.2m in Ontario will improve productivity through better harmonization with Michigan. With the 3 axles spaced at least 2.75m apart, the carrying capacity between Ontario and Michigan is increased by an additional 6,800 kg (15,000 lbs) as compared to a 16.2m tridem semi-trailer. • Michigan allows 50' (15.25m) semi-trailers. Allowing the 5-axle semi-trailer to operate at this length in Ontario provides more flexibility for spacing extra axles.
Safety Impact	• Computer simulations show that the overall high speed dynamic performance of longer semi-trailers is slightly better than shorter semi-trailers because the centre of gravity of the payload is generally lower and the wheelbase of the trailer is typically longer. • With controlled tractor wheelbases, 16.2m semi-trailers turn within nationally accepted offtracking targets. • Research has shown that the length of the end-dump box is one of a number of factors that can increase the risk of the vehicle tipping over while dumping. Limiting the box length to 14.65m will prevent any increase in this risk as a result of proposed changes in semi-trailer lengths.
Infrastructure Impact	• Infrastructure is not impacted as these changes do not result in any increase in axle or gross vehicle weight .

B.6) Harmonize SPIF Semi-Trailer Axle Spreads with Michigan (SPIF vehicles #1, 2, 6, 7)

Current Rules	• HTA Regulation 32/94 currently limits semi-trailers longer than 14.65m to a tandem axle spread of 1.2 to 1.85m which conforms to national MoU minimum requirements. Allowable tandem axle weights range from 18,000 kg to 19,100 kg. • There are no limits on tandem axle spreads for trailers up to 14.65m. • There is currently no maximum limit on the tandem axle spread of the Self-Steer Triaxle Semi-Trailer. The self-steer axle may be up to 3.0m ahead of the tandem. Maximum allowable weight on the trailer axles is 28,650 kg. • Michigan allows 34,000 lbs (15,400 kg) for the tandem axles of a 2 axle semi-trailer for spreads up to 108" (2.74m), and 36,000 lbs (16,330 kg) on spreads of 108" or more. • Michigan allows 39,000 lbs (17,690 kg) on the trailer axles of a 3-axle semi-trailer when the axles are less than 108" apart, and 54,000 lbs (24,500 kg) when the axles are 108" or more apart.
Proposed	• Standardize the maximum tandem axle spread at 2.8m for SPIF tandem axle semi-trailers and SPIF Self-Steer Triaxle Semi-Trailers (including those up to 16.2m).
Key Details	• Testing of the tandem semi-trailer with an axle spread up to 2.8m shows that the vehicle meets all national performance targets: o Allowable tandem spread for SPIF fixed axle semi-trailers (SPIF Vehicles #1 and #6) is set as 1.2 to 2.8m. • Further testing of the Self-Steer Triaxle Semi-Trailer shows that the high speed performance of the vehicle begins to deteriorate as the axles are more widely spaced. To address this: o The tandem axle of the Self-Steer Triaxle (SPIF Vehicles # 2 and #7) is restricted to a spread of 1.2 to 2.8m; o In cases where the tandem spread exceeds 1.85m, the self-steer axle must be equipped with an automatic locking device that locks the axle in the straight-ahead position above a specified speed and unlocks it at slower speeds for turning.
Productivity Impact	• This change is expected to result in productivity improvements through improved harmonization with Michigan for tandem and Self-Steer Triaxle semi-trailers: o If the tandem spread of a tandem semi-trailer is at least 2.74m (108"), the carrying capacity between Ontario and Michigan is increased by an additional 930 kg (2,000 lbs); o If the three axles on the Self-Steer Triaxle are spaced at least 2.75m apart, the carrying capacity between Ontario and Michigan is increased by an additional 6,800 kg (15,000 lbs). • The US Bridge Formula allows 39,000 lbs (17,690 kg) on a 108" (2.74m) spread tandem. While this does not add to the 80,000 lb (36, 290 kg) gross weight in most other US states, the higher tandem axle weight allowance does provide more flexible loading.
Safety Impact	• Computer simulations show that the dynamic performance of the wider spread tandem semi-trailer is within all accepted performance measures. • Restricting the tandem axle spread of the Self-Steer Triaxle, and requiring a locking device on the self-steer axle in certain cases, ensures that this trailer operates with acceptable performance characteristics.
Infrastructure Impact	• There is a minimal benefit to infrastructure as Ontario weight allowances on a 2.8m tandem are the same as on a 1.85m tandem. Larger axle spreads general cause less stress to bridges.

B.7) Standardize Internal Dimensions of SPIF Semi-Trailers (SPIF vehicles #1 - 8)

Current Rules	• Various internal dimensions of semi-trailers longer than 14.65m are carefully controlled *under HTA Regulation 32/94 to meet national performance* standards. These include: o kingpin setback swing radius; o semi-trailer wheelbase minimum and maximum limits; o inter-axle spacing minimum limits; o axle spread allowances; o track width requirements; o effective rear overhang. • The above limits do not apply to semi-trailers up to 14.65m long.
Proposed	• Apply HTA Regulation 32/94 semi-trailer specifications to all SPIF semi-trailers. These specifications restrict kingpin setback, wheelbase limits, inter-axle spacing, axle spreads, track width and effective rear overhang.
Key Details	• Regulation 32/94 rules closely emulate national standards set out in the national Memorandum of Understanding (MoU) Agreement on Vehicle Weights and Dimensions (which were, in turn, based on dynamic performance criteria developed in the 1986 CCMTA/RTAC VW&D Study). Rules include: o kingpin setback so that swing radius does not exceed 2m; o wheelbase limits are 6.25 to 12.5m; o interaxle spacing minimums: o single to single, tandem or tridem 3.0m; o tandem to tandem 5.0m; o tandem to tridem 5.5m. o allowable axle spreads: o tandem 1.2 to 2.8m (see B.6 above); o tridem 2.4 to 3.7m. o track width must be 2.5 to 2.6m if trailer > 2.5m wide; o effective rear overhang not to exceed 35% of wheelbase.
Productivity Impact	• Changes are not expected to have a major impact on productivity. • Rules better harmonize with other provinces.
Safety Impact	• Extension of Regulation 32/94 rules ensures that SPIF semi-trailers meet accepted national high speed and low speed performance measures.
Infrastructure Impact	• Vehicles with controlled wheelbases require less turning space and are less likely to interfere with roadside fixtures at intersections.

B.8) **Standardize SPIF Axle Weights** (SPIF vehicles #9 - 11)

Current Rules	• As part of Phase 1 VW&D reforms, the weight on the tandem axles of all 3-axle tandem-drive tractors and tandem axle single semi-trailers was increased to the proposed national standard of 18,000 kg for spreads of 1.2 < 1.6m. • Similarly, scheduled axle weight increases for tridem axle single semi-trailers were implemented as follows: o 3.0 < 3.6m spread - 24,000 kg (effective 2006) o 3.6 to 3.7m spread - 25,500 kg (2001) moving to 26,000 kg (2006) • Tandem and Tridem axle weights of double trailers are restricted to weights allowed in HTA Axle Weight Tables 1 and 2 respectively.
Proposed	• Extend axle weight increases provided to single semi-trailers in Phase 1 to SPIF double trailers as identified in Phase 3.
Key Details	• To simplify and harmonize weight allowances for the common 1.2 < 1.6m spread tandem axle, the proposed national standard for tandem axles was set at 18,000 kg: o For tandem axles of SPIF double trailers #9 to #11, tandem spreads of 1.2 < 1.6m may operate at weights up to 18,000 kg . • To simplify and harmonize weight allowances for the common 3.0 < 3.6m spread of tridem axle, the proposed national standard for tridem axles was set at 24,000 kg. Phase 1 VW&D reforms determined that the tridem weight increases were not possible until the accompanying triaxle weight decreases took effect in 2006: o For tridem axles of SPIF double trailers #9 to #11, tridem spreads of 3.0 < 3.1m may operate at weights up to 24,000 kg (effective 2006)
Productivity Impact	• This is expected to provide a productivity increase as it provides a slightly higher weight for the most common tandem and tridem axle spreads. This extra axle weight allowance will provide more flexibility in loading. • This is expected to result in productivity improvements related to better harmonization with Quebec and eastern provinces as these jurisdictions have adopted the nationally recommended 18,000 kg and 24,000 kg weights at the above spreads. • This is expected to simplify compliance as these axle weight allowances standardize weights for common axle spreads.
Safety Impact	• These axle weights are recommended by the Task Force on VW&D Policy and meet accepted performance measures.
Infrastructure Impact	• It has been determined that tandems at 18,000 kg and tridems at 24,000 kg at the indicated spreads are acceptable weights for SPIF vehicles. These weights have already been granted to Phase 1 and 2 SPIF vehicles and to the tandem drive axles of all 3-axle tractors. The increase in tridem weights is effective January 1, 2006.

B.9) Standardize Weight Cap on Axles with Single Tires (SPIF vehicles #1 - 11)

Current Rules	• Tractor-trailers with semi-trailers longer than 14.65m, and with double trailers where overall length is greater than 23m or where box length is greater than 18.5m, are subject to HTA Regulation 32/94. This regulation limits any single tire to 3,000 kg - effectively 6,000 kg per axle when equipped with single tires. • All other trucks and tractor-trailers are subject to general HTA rules which limit the weight on any axle equipped with single tires to a maximum of 9,000 kg. • The self-steer axle of the Self-Steer Triaxle has a maximum axle weight of 9,000 kg when equipped with single tires, provided tires are at least 410 mm wide. • The self-steer axle of the Self-Steer Quad has a maximum axle weight of 8,000 kg (when tridem spread is 3.0 < 3.6m) or 8,500 kg (when tridem spread is 3.6 to 3.7m). If equipped with single tires, the tires must be 365 mm and 385 mm wide respectively. • Common 5-axle tractor-trailers operating to and from the United States at a gross weight of 80,000 lbs (36,290 kg) are typically allowed 34,000 lbs (15,400 kg) on the tractor and trailer tandem axles under the US Bridge Formula.
Proposed	• The maximum weight on any tire of a SPIF tractor-trailer or double trailer combination be set as 3,850 kg (effectively 7,700 kg per axle when equipped with single tires). Self-steer axles on the Self-Steer Triaxle and Self-Steer Quad semi-trailers are exempt.
Key Details	• Extensive research has shown that wide single tires do no more damage to roads than dual tires up to axle weights in the mid-7,000 kg range. Above these weights, wide single tires cause progressively more road damage than dual tires: o Limit the weight on any tire of a SPIF tractor-trailer or double trailer combination to 3,850 kg. • In many applications, dual tires are not practical on self-steer axles as there is insufficient frame width on the trailer to allow the wheels to turn. Research indicates that the infrastructure benefits associated with the SPIF self-steer semi-trailers outweigh the additional damage associated with wide single tires: o The self-steer axle of the Self-Steer Triaxle and Quad semi-trailers are exempted from the 3,850 kg per tire limit.
Productivity Impact	• Vehicles equipped with wide-based single tires are lighter than those equipped with dual tires, and may be able to carry more payload. • Wide single tires have less rolling resistance than dual tires and are thus more fuel efficient. • Allowing 7,700 kg per axle equipped with single tires (15,400 kg per tandem axle) improves harmonization with US standards.
Safety Impact	• Significant research concludes that wide single tires are as safe as dual tires. Test vehicles are able to maintain control even when both tires on one side of a tandem experience blow-outs. • If the distance to the outer face of the tires (track width) is the same, the distance between the centre point of wide based tires is wider than between the centre point of dual tires. This provides better vehicle stability. • Trailers equipped with single tires may be built with wider frame rails and, in the case of body styles such as tankers, with lowered bodies. This may result in a lower centre of gravity and better vehicle stability.
Infrastructure Impact	• Tire manufacturers are introducing a new technology of wide-based single tires specifically designed to replace dual tires on tractors and trailers. MTO research shows that, at 7,700 kg per axle, these tires cause no more damage to pavement than dual tire equipped axles loaded to 8,600 kg.

B.10) Standardize Rules for Self-Steer Axles on SPIF vehicles: (SPIF vehicles #2-5, 7, 8)

Current Rules	• Rules for self-steer axles currently apply to the Self-Steer Triaxle and Self-Steer Quad (SPIF #2 and #3): o Self-steer axles may be fitted with single or dual tires of sufficient width; o Self-steer axles may be liftable and operated raised when: o vehicle is reversing; o remaining axles are within legal weight limits; o vehicle is not on a public roadway. o Self-steer axle lift controls must be located only on the trailer. Axle may not be controlled from the tractor; o May have a self-contained device on the trailer that automatically lifts the axle(s) when vehicle is reversing; o Self-steer axles must be capable of turning at least 20° in each direction; o Self-steer axles must automatically load-equalize with other trailer axles.
Proposed	• Extend existing rules to all SPIF vehicles equipped with self-steer axles. In addition, the forward self-steer axle of the 5-axle 1-1-3 semi-trailer must turn at least 25° and, in certain cases, the self-steer axles will be required to have an automatic locking device that engages above a certain speed.
Key Details	• Self-steer axles on SPIF semi-trailers are intended to be deployed during normal loaded operations on public highways. When operating in a forward direction, there is no need to raise or lower the axles. Existing rules carefully specify when the vehicles may operate with axles raised, and do not allow the driver to control the axle while the vehicle is in motion: o Existing self-steer axle rules extended to all SPIF semi-trailers. • The forward self-steer axle of the 5-axle 1-1-3 SPIF semi-trailer must be able to turn sharper than other self-steer axles because of its distance from the centre of the tridem axle, which approximates the turn centre of the trailer: o Forward self-steer axle of SPIF Vehicle #5 must be capable of turning at least 25°. • In certain cases, equipping semi-trailers with self-steer axles introduces undesirable high speed performance characteristics. These characteristics can be improved by locking the axle in the straight-ahead position at highway speeds: o Self-steer axles of the following vehicles must be equipped with a locking device which automatically engages at higher speeds, and disengages at lower speeds for turning: o Rearmost axle of SPIF Vehicle #4 (5-axle 1-3-1); o Self-Steer Triaxle (SPIF # 2 and #7) when tandem spread exceeds 1.85m.
Productivity Impact	• These rules are not expected to impact productivity of vehicles.
Safety Impact	• Ensuring that self-steer axles are properly deployed while operating the vehicle on public roadways avoids axle overloading. Overloaded axles are susceptible to component failure and introduce undesirable performance characteristics. • An automatic device which lifts the self-steer axle when reversing allows the driver to back-up without getting out of the cab of the tractor. This may be beneficial when it is dangerous to leave the cab of the vehicle. • The self-steer axle locking device on certain SPIF vehicles ensures that high speed performance characteristics of these vehicles stays within acceptable levels.
Infrastructure Impact	• Self-steer axles remain on the ground under normal loaded operations, thus avoiding axle overloads associated with lift-axles. • Load equalization of all trailer axles optimizes the weight distribution and minimizes pavement damage.

B.11) Standardize Rules for Additional Lift-Axles on SPIF Vehicles: (SPIF vehicle #1-11)

Current Rules	Under HTA regulations, the following vehicles are currently restricted from being equipped with liftable axles (whether or not deployed in Ontario): • The Self-Steer Triaxle semi-trailer may not have any additional lift-axles (though self-steer axle may be liftable). • Semi-trailers longer than 14.65m may not have any lift-axles. • 5 to 7 axle double trailer combinations where overall length is greater than 23m or box length is greater than 18.5m may not have any lift-axles. • Tractors when combined with trailers controlled under Regulation 32/94, or when combined with Self-Steer Triaxle or Self-Steer Quad semi-trailers. The following are allowed to have additional lift-axles: • 8 or 9 axle double trailers combinations up to 25m overall length may have one non-deployed lift-axle on each trailer providing a number of conditions are met. • The Self-Steer Quad semi-trailer may have one non-deployed lift-axle (in addition to liftable self-steer axle). • There are no restrictions on use of lift-axles, whether or not deployed, for all other tractors, semi-trailers and double trailers.
Proposed	• All SPIF semi-trailers and double trailers may be equipped with additional lift-axles. These axles may not be deployed in Ontario and are excluded from the allowable gross weight calculation. • SPIF tractors may not be equipped with any type of lift-axle or self-steer axle, whether raised, lowered or rendered inoperative.
Key Details	• More axles are required in Michigan to achieve similar gross vehicle weights as in Ontario. To optimize payload capacity between the two jurisdictions, there is a need to deploy additional axles when operating in Michigan. o SPIF semi-trailers and double trailers may be equipped with additional lift-axles; o Axles may not be deployed in Ontario or contribute to the allowable gross weight calculation (unless authorized by valid O/O permit); o Additional lift-axle may be controlled from the tractor cab • SPIF tractors approved to-date include those equipped with a single front steering axle combined with single, tandem or tridem drives. It is expected that other tractor configurations will be investigated in Phase 4 of this project, including twin-steer tractors and tractors with a self-steer pusher axle.
Productivity Impact	• Allowing additional non-deployed lift-axles allows harmonization of gross vehicle weights for SPIF vehicles travelling between Michigan and Ontario. It allows SPIF vehicles to deploy one or more additional axles to compensate for lower axle weight limits in Michigan.
Safety Impact	• In Ontario, additional lift-axles will not alter the performance or safety of SPIF vehicles as they may not be deployed in Ontario or add to the vehicle's allowable weight. • These axle(s) may be raised and lowered from the cab of the tractor to allow the vehicle to negotiate corners in Michigan. This is similar to current practice in that jurisdiction. When the axle(s) are raised for cornering, the dynamic performance of the vehicle is the same as in Ontario.
Infrastructure Impact	• There is no impact on infrastructure as any additional standard lift-axles may not be deployed in Ontario, unless authorized by a valid O/O permit.

B.12) Standardize Gross Weight Calculation for SPIF Vehicles: (SPIF vehicles #4-11)

Current Rules	• HTA Regulation 597 specifies that, when carrying aggregate product, vehicles with 3 or more axles are subject to a special calculation to determine allowable gross vehicle weight, including a 1,500 kg reduction. • Phase 1 and 2 SPIF semi-trailers are exempted from this special calculation and reduction.
Proposed	• Phase 3 SPIF semi-trailer and double trailer combinations also be exempted from the special GVW calculation and 1,500 kg GVW reduction. The standard HTA allowable gross weight calculations will therefore be used for all SPIF vehicles regardless of product carried. • The special aggregate calculation and weight reduction will continue to apply to all non-SPIF vehicles when carrying aggregate product.
Key Details	• The special aggregate calculation was designed to remove variables from the allowable gross weight calculation of aggregate vehicles and to create a buffer so that vehicles loaded to the allowable gross weight were less likely to have axle overloads. • Axle overloads are more easily controlled in SPIF vehicles through load-equalization of all trailer axles and use of self-steering rather than standard lift-axles. • A more limited number of standardized SPIF vehicles will lead to more consistent, standardized placement of the loads on these vehicles.
Productivity Impact	• Exempting SPIF vehicles from this special calculation leads to less complex rules as the same set of GVW calculations applies regardless of product carried. • Exemption from the 1,500 kg GVW aggregate reduction is expected to result in productivity improvements when carrying aggregate products as SPIF vehicles will be able to carry more payload.
Safety Impact	• The special gross weight calculation and weight reduction are considered unnecessary for SPIF vehicles when carrying aggregate products as they are less susceptible to axle overloads. • A single set of allowable gross weight calculations is expected to improve compliance as the calculations will apply to vehicles carrying aggregate product as well as vehicles carrying non-aggregate product.
Infrastructure Impact	• It is expected that automatic load-equalization and use of self-steer rather than standard lift-axles will achieve the same benefits as the special aggregate gross weight calculation.

B.13) Allowable Gross Vehicle Weight Reductions for Non-SPIF Vehicles:
(does not impact SPIF vehicles)

Current Rules	• HTA Regulation 597 specifies that non-SPIF 3-axle semi-trailers (other than end-dump, open-top hopper dump, and some very specialized tankers) are subject to a 3,000 kg reduction from allowable gross weight starting in 2006. • The 3,000 kg reduction increases to 4,500 kg in 2011 for non-SPIF 3-axle semi-trailers (other than end-dumps, open-top hopper dump and liquid or dry-bulk tankers). • The 3,000 kg reduction increases to 4,500 kg in 2021 for all 3-axle liquid or dry-bulk tankers. The 4,500 kg reduction in 2021 also applies to the specialized tankers exempted from the original 3,000 kg reduction.

Proposed	• The above weight reductions also apply to non-SPIF 1 and 2 axle semi-trailers (with the same exceptions that apply to 3-axle semi-trailers).
	
	• Phase 3 vehicles (non-dump semi-trailers with 4 or more axles and double trailers) manufactured after 2005 must be built to SPIF standards or operate at reduced weights:
	  • 4,500 kg GVW reduction if equipped with up to one deployed lift-axle;
	  • 9,000 kg GVW reduction if equipped with two or more deployed lift-axles.
	
	• All Phase 3 non-SPIF vehicles manufactured prior to 2006 are exempt from weight reduction until 2016, then must operate at reduced weights:
	  • 4,500 kg GVW reduction if equipped with up to one deployed lift-axle;
	  • 9,000 kg GVW reduction if equipped with two or more deployed lift-axles.
	
	• Depending on age of trailer, Phase 3 non-SPIF vehicles manufactured prior to 2006 may have exemption from gross weight reduction extended beyond 2016 by special annual permit:
	  • for non-tank semi-trailers until trailer reaches 15 years of age;
	  • for liquid or dry-bulk tankers until trailer reaches 20 years of age.

Key Details	• Standards for 1 and 2-axle SPIF semi-trailers closely emulate national standards set out in the national Memorandum of Understanding (MoU) Agreement on Vehicle Weights and Dimensions. Applying a gross weight reduction to vehicles which do not meet these standards provides an incentive to comply with the standards and reduces the safety and infrastructure impacts of non-complying vehicles. • Proposed reductions for new Phase 3 vehicles parallel reductions applied in Phase 2. The significant gross weight reductions provide a strong incentive to build new trailers to SPIF specifications, or operate at weights that reduce the safety and infrastructure impacts. • Proposed grandfathering of existing Phase 3 vehicles parallels grandfathering applied in Phase 2, and is intended to provide a reasonable period in which operators can recoup their investment in existing equipment. Research indicates that liquid and dry-bulk tankers are typically more valuable trailers and have a longer average operating life than other trailers. At end of grandfather period, these vehicles may be converted to SPIF trailers, retired, or continue to operate at reduced weights.
Productivity Impact	• The vast majority of 1 and 2 axle semi-trailers are believed to already comply with SPIF requirements. • The grandfathering of existing trailers is believed to approximate the average life of such trailers and provide operators sufficient time to recoup investment.
Safety Impact	• The significant benefits relating to the migration to Phase 3 SPIF vehicles will commence in 2006 and continue through the 15 to 20 year transition.
Infrastructure Impact	• The significant benefits relating to the migration to Phase 3 SPIF vehicles will commence in 2006 and continue through the 15 to 20 year transition.

Appendix C

Safe, Productive, Infrastructure-Friendly (SPIF) Vehicles
Existing and Proposed

Note 1: Standards for SPIF Vehicles #4 and #5 are preliminary, subject to further full-scale testing.

Note 2: The terms 'Tandem' and 'Tridem' axles mean two or three equally spaced consecutive axles that automatically equalize the load on each axle. Tandem and Tridem axles must have the same number of tires at each wheel position, and may not include liftable axles or self-steer axles.

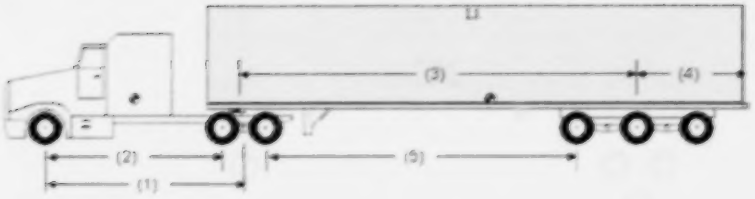
Note 3: Overall length, width and height of SPIF vehicles includes any part of the vehicle and load. See Section 109 of the HTA for exemptions from the width provisions.

Note 4: The maximum 14.65m length of a 'short' semi-trailer excludes non load-carrying auxiliary equipment or machinery that extends beyond the front or rear of the trailer. The maximum 16.2m length of a 'long' semi-trailer excludes such items at the front of the trailer, but includes them if they are at the rear of the trailer.

Note 5: Ontario regulates vehicle weights in kilograms (kg) and dimensions in metres (m) and millimetres (mm). Equivalent imperial measures can be calculated using:

1 m = 1000 mm = 39.37 inches = 3.2808 feet
1 foot = 304.8 mm = 0.3048 m
1 inch = 25.4 mm = 0.0254 m
1 kg = 2.2046 pounds
1 pound = 0.4536 kg

SPIF Vehicle #1
Tractor Fixed Axle Semi-Trailer

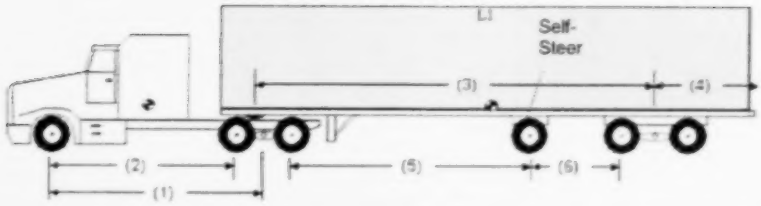


Item	Dimension / Weight		Short	Long	Limit
Overall	Length		x	x	Max 23.0m
	Width		x	x	Max 2.6m
	Height		x	x	Max 4.15m
	Non-deployed lift-axles allowed (semi-trailer only)		x	x*	no limit
Tractor	Wheelbase (1)			x	Max 6.2m
	Wheelbase (1) 2006+ tractor model year		x*		Max 6.2m
	Steering Axle Allowed		x*	x	Single Axle / Single Tires
	Drive Axles Allowed		x*	x	Single or Tandem
	Tandem Spread		x*	x	1.2 to 1.85m
Semi-Trailer	Length	[see Note below]	x		Max 14.65m
	Length	[see Note below]		x	Max 16.2m***
	End-Dump Box Length		x	x*	Max 14.65m
	Wheelbase (3)		x*	x	6.25 to 12.5m
	Kingpin Setback		x*	x	Max 2.0m radius
	Effective rear overhang (including load) (4)		x*	x	Max 35% of wheelbase
	Axle Groups Allowed		x*	x	Single, Tandem, Tridem
	Tandem Spread		x*	x*	1.2 to 2.8m
	Tridem Spread		x*	x	2.4 to 3.7m
	Track Width if trailer > 2.5m wide		x*	x	2.5 to 2.6m
Inter-Axle	Single to Single, Tandem or Tridem (2) (5)		x*	x	Min 3.0m
	Tandem to Tandem (5)		x*	x	Min 5.0m
	Tandem to Tridem (5)		x*	x	Min 5.5m

Tire Weights	Width < 150 mm as marked on tire		x	x	Max 9 kg/mm
	Width 150 mm or more as marked on tire		x*	x*	Max 11 kg/mm or 3,850 kg
Axle Weights	Steering Axle > 5,000 kg		x*	x*	Max GAWR or 7,700 kg
	Single Axle:		x	x	Max 10,000 kg
(Dual tires needed if:	Tandem Axle:	1.2 < 1.6m	x	x	Max 18,000 kg
- single axle > 7,700 kg		1.6 < 1.7m	x	x	Max 18,300 kg
- tandem > 15,400 kg		1.7 < 1.8m	x	x	Max 18,700 kg
- tridem > 23,100 kg)		1.8 or more	x	x	Max 19,100 kg
	Tridem Axle:	2.4 < 3.0m	x	x	HTA Table 2
		3.0 < 3.6m (until 2006)	x	x	HTA Table 2
		3.0 < 3.6m (2006)	x	x	Max 24,000 kg
		3.6 to 3.7m (until 2006)	x	x	Max 25,500 kg
		3.6 to 3.7m (2006)	x	x	Max 26,000 kg
Typical GVW**					
3 Axles	5,000 + 10,000 + 10,000		x	x	25,000 kg
4 Axles	5,400 + 10,000 + 18,000		x	x	33,400 kg
5 Axles	5,400 + 18,000 + 19,100		x	x	42,500 kg
6 Axles	5,400 + 18,000 + 25,500		x	x	48,900 kg
	** Also check Gross Weight Tables 1 - 15				

Notes:
- 'Short' means semi-trailer is 14.65m or less;
- 'Long' means semi-trailer length is more than 14.65m;
- 'x' indicates that item is controlled;
- * Indicates Phase 3 proposed change from rules that would normally apply;
- ** Use actual front (scaled) axle weight in GVW calculation up to maximum allowed;
- *** Including any auxiliary equipment or machinery at back of trailer.

SPIF Vehicle #2
Tractor Self-Steer Triaxle Semi-Trailer

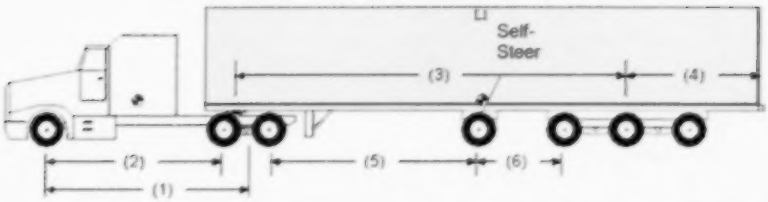


Item	Dimension / Weight	Short	Long*	Limit
Overall	Length	x	x	Max 23.0m
	Width	x	x	Max 2.6m
	Height	x	x	Max 4.15m
	Non-deployed lift-axles allowed (semi-trailer only)	x*	x	no limit
Tractor	Wheelbase (1)		x	Max 6.2m
	Wheelbase (1) 2006+ tractor model year	x*		Max 6.2m
	Steering Axle Allowed	x*	x	Single Axle / Single Tires
	Drive Axles Allowed	x	x	Tandem
	Tandem Spread	x*	x	1.2 to 1.85m
Semi-Trailer	Length [see Note below]	x		Max 14.65m
	Length [see Note below]		x*	Max 16.2m***
	End-Dump Box Length	x	x	Max 14.65m
	Wheelbase (3)	x*	x	6.25 to 12.5m
	Kingpin Setback	x*	x	Max 2.0m radius
	Effective rear overhang (including load) (4)	x	x	Max 35% of wheelbase
	Tandem Spread ****	x*	x*	1.2 to 2.8m
	Self-Steer ahead of Tandem (6)	x	x	>2.5 to 3.0m
	Track Width if trailer > 2.5m wide	x*	x	2.5 to 2.6m
Inter-Axle	Single to Tandem (2) (5)	x*	x	Min 3.0m

Tire Weights	Width < 150 mm as marked on tire	x	x	Max 9 kg/mm
	Width 150 mm or more as marked on tire	x*	x	Max 11 kg/mm or 3,850 kg
	Self-Steer Axle single tire 150 mm or more	x	x	Max 11 kg/mm or 4,500 kg
Axle Weights	Steering Axle > 5,000 kg	x*	x	Max GAWR or 7,700 kg
	Tandem Axle: 1.2 < 1.6m	x	x	Max 18,000 kg
(Dual tires needed if:	1.6 < 1.7m	x	x	Max 18,300 kg
- tandem > 15,400 kg	1.7 < 1.8m	x	x	Max 18,700 kg
- self-steer > 9,000 kg)	1.8 or more	x	x	Max 19,100 kg
	Self-Steer Axle	x	x	⅓ weight on Tandem
Typical GVW**				
6 Axles	5,400 + 18,000 + 9,000 + 18,000	x	x	50,400 kg
6 Axles	5,400 + 18,000 + 9,550 + 19,100	x	x	52,050 kg
	** Also check Gross Weight Tables 9 - 15			

Notes:
- 'Short' means semi-trailer is 14.65m or less;
- 'Long' means semi-trailer length is more than 14.65m;
- 'x' indicates that item is controlled;
- * Indicates Phase 3 proposed change from rules that would normally apply;
- ** Use actual (scaled) front axle weight in GVW calculation up to maximum allowed;
- *** Including any auxiliary equipment or machinery at back of trailer;
- **** if tandem spread > 1.85m, self-steer axle is equipped with a device to lock axle in straight ahead position at highway speed (tbd);
- Self-steer axle must turn at least 20° in either direction;
- Three trailer axles must automatically load-equalize;
- If self-steer axle is liftable, there is no cab control. When lifted, vehicle meets SPIF #1 rules;
- May have automatic lift controls that activate when the vehicle is reversing;
- Trailer has original compliance label;
- The notation "Reg 597(Ont)-3" shows on trailer compliance label or ID plate signifying that an approved facility has manufactured or retrofitted the trailer to these specifications.

SPIF Vehicle #3
Tractor Self-Steer Quad Semi-Trailer

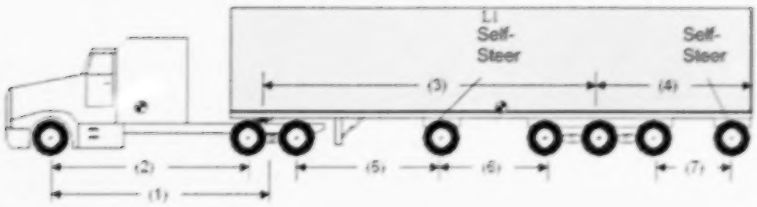


Item	Dimension / Weight	Short	Long*	Limit
Overall	Length	x	x	Max 23.0m
	Width	x	x	Max 2.6m
	Height	x	x	Max 4.15m
	Non-deployed lift-axles allowed (semi-trailer only)	x*	x	no limit
Tractor	Wheelbase (1)		x	Max 6.2m
	Wheelbase (1) 2006+ tractor model year	x*		Max 6.2m
	Steering Axle Allowed	x*	x	Single Axle / Single Tires
	Drive Axles Allowed	x	x	Tandem
	Tandem Spread	x*	x	1.2 to 1.85m
Semi-Trailer	Length [see Note below]	x		Max 14.65m
	Length [see Note below]		x*	Max 16.2m***
	End-Dump Box Length	x	x	Max 14.65m
	Wheelbase (3)	x*	x	6.25 to 12.5m
	Kingpin Setback	x*	x	Max 2.0m radius
	Effective rear overhang (including load) (4)	x	x	Max 35% of wheelbase
	Tridem Spread	x	x	3.0 to 3.7m
	Self-Steer ahead of Tridem (6)	x	x	>2.5 to 3.0m
	Track Width if trailer > 2.5m wide	x*	x	2.5 to 2.6m
Inter-Axle	Single to Tandem (2)	x*	x	Min 3.0m
	If Tridem spread is 3.0 < 3.6m (5)	x	x	Min 6.0m
	If Tridem spread is 3.6 to 3.7m (5)	x	x	Min 5.5m

Tire Weights	Width < 150 mm as marked on tire	x	x	Max 9 kg/mm
	Width 150 mm or more as marked on tire	x*	x	Max 11 kg/mm or 3,850 kg
	Self-Steer Axle single tire (365 < 385 mm width)	x	x	Max 4,000 kg
	Self-Steer Axle single tire (385 mm or more)	x	x	Max 4,250 kg
Axle Weights	Steering Axle > 5,000 kg	x*	x	Max GAWR or 7,700 kg
	Tandem Drives: 1.2 < 1.6m	x	x	Max 18,000 kg
(Dual tires needed if:	1.6 < 1.7m	x	x	Max 18,300 kg
- tandem > 15,400 kg	1.7 < 1.8m	x	x	Max 18,700 kg
- tridem > 23,100 kg)	1.8m or more	x	x	Max 19,100 kg
	Tridem Axle: 3.0 < 3.6m	x	x	Max 24,000 kg
	3.6 to 3.7m	x	x	Max 25,500 kg
	Self-Steer Axle	x	x	1/3 weight on Tridem
Typical GVW**				
7 Axles	5,400 + 18,000 + 8,000 + 24,000	x	x	55,400 kg
7 Axles	5,400 + 18,000 + 8,500 + 25,500	x	x	57,400 kg
	** Also check Gross Weight Table 22			

Notes:
- 'Short' means semi-trailer is 14.65m or less;
- 'Long' means semi-trailer length is more than 14.65m;
- 'x' indicates that item is controlled;
- * Indicates Phase 3 proposed change from rules that would normally apply;
- ** Use actual (scaled) front axle weight in GVW calculation up to maximum allowed;
- *** Including any auxiliary equipment or machinery at back of trailer;
- Self-steer axle must turn at least 20° in either direction;
- Four trailer axles must automatically load-equalize;
- If self-steer axle is liftable, there is no cab control. When lifted, vehicle meets SPIF #1 rules;
- May have automatic lift controls that activate when the vehicle is reversing;
- Has a device, or device plus chart, which accurately displays total kilograms on trailer axles;
- Trailer has original compliance label. The notation "Reg 597(Ont)-4" shows on trailer compliance label or ID plate signifying that an approved facility has manufactured or retrofitted the trailer to specifications

SPIF Vehicle #4
Tractor Self-Steer 5-Axle Semi-Trailer (1-3-1)

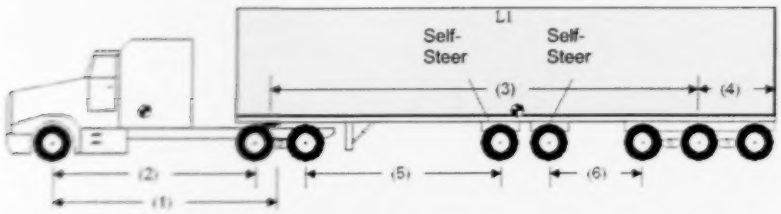


Item	Dimension / Weight	Short*	Long*	Limit
Overall	Length	x	x	Max 23.0m
	Width	x	x	Max 2.6m
	Height	x	x	Max 4.15m
	Non-deployed lift-axles allowed (semi-trailer only)	x	x	no limit
Tractor	Wheelbase (1)		x	Max 6.2m
	Wheelbase (1) 2006+ tractor model year	x*		Max 6.2m
	Steering Axle Allowed	x*	x	Single Axle / Single Tires
	Drive Axles Allowed	x*	x	Tandem
	Tandem Spread	x*	x	1.2 to 1.85m
Semi-Trailer	Length [see Note below]	x		Max 14.65m
	Length [see Note below]		x*	Max 16.2m***
	End-Dump Box Length	x	x	Max 14.65m
	Wheelbase (3)	x*	x	9.5 to 12.5m
	Kingpin Setback	x*	x	Max 2.0m radius
	Effective rear overhang (including load) (4)	x*	x	Max 4.5m
	Tridem Spread	x*	x	3.0 to 3.1m
	Self-Steer ahead of Tridem (6)	x*	x	2.8 to 3.0m
	Self-Steer behind Tridem (7)	x*	x	2.1 to 2.3m
	Track Width if trailer > 2.5m wide	x*	x	2.5 to 2.6m
Inter-Axle	Single to Tandem (2)	x*	x	Min 3.0m
	Tandem to Self-Steer (5)	x*	x	Min 4.0m

Tire Weights	Width < 150 mm as marked on tire	x	x	Max 9 kg/mm
	Width 150 mm or more as marked on tire	x*	x	Max 11 kg/mm or 3,850 kg
Axle Weights	Steering Axle > 5,000 kg	x*	x	Max GAWR or 7,700 kg
	Tandem Drives: 1.2 < 1.6m	x	x	Max 18,000 kg
(Dual tires needed if	1.6 < 1.7m	x	x	Max 18,300 kg
tandem > 15,400 kg)	1.7 < 1.8m	x	x	Max 18,700 kg
	1.8m or more	x	x	Max 19,100 kg
	Tridem Axle: 3.0 to 3.1m	x*	x	Max 22,500 kg
	Each Self-Steer Axle	x*	x	1/3 weight on Tridem
Typical GVW**				
8 Axles	6,000 + 18,000 + 7,500 + 22,500 + 7,500	x	x	61,500 kg
	** Also check Gross Weight Table 29			

Notes:
- 'Short' means semi-trailer is 14.65m or less;
- 'Long' means semi-trailer length is more than 14.65m;
- 'x' indicates that item is controlled;
- * Indicates Phase 3 proposed change from rules that would normally apply;
- ** Use actual (scaled) front axle weight in GVW calculation up to maximum allowed;
- *** Including any auxiliary equipment or machinery at back of trailer;
- Self-steer axles must turn at least 20° in either direction;
- Equipped with device to lock rear self-steer axle in straight ahead position at highway speed (tbd);
- Five trailer axles must automatically load-equalize;
- If self-steer axles are liftable, there is no cab control. Both axles must be lifted together. When axles are lifted, vehicle meets SPIF #1 rules except for 35% effective overhang;
- May have automatic lift controls that activate when the vehicle is reversing;
- Has a device, or device plus chart, which accurately displays total kilograms on trailer axles;
- Trailer has original compliance label. The notation "Reg 597(Ont)-5" shows on trailer compliance label or ID plate signifying approved facility has manufactured or retrofitted the trailer to specifications.

SPIF Vehicle #5
Tractor Self-Steer 5-Axle Semi-Trailer (1-1-3)

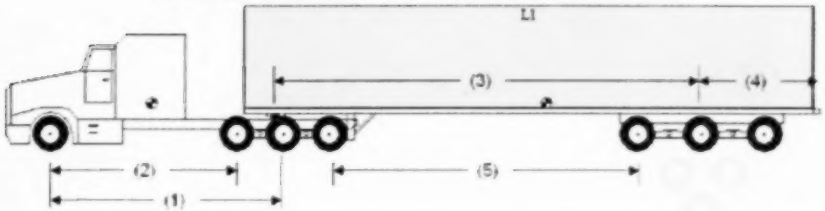


Item	Dimension / Weight	Short*	Long*	Limit
Overall	Length	x	x	Max 23.0m
	Width	x	x	Max 2.6m
	Height	x	x	Max 4.15m
	Non-deployed lift-axles allowed (semi-trailer only)	x	x	no limit
Tractor	Wheelbase (1)		x	Max 6.2m
	Wheelbase (1) 2006+ tractor model year	x*		Max 6.2m
	Steering Axle Allowed	x*	x	Single Axle / Single Tires
	Drive Axles Allowed	x*	x	Tandem
	Tandem Spread	x*	x	1.2 to 1.85m
Semi-Trailer	Length [see Note below]	x		Max 14.65m
	Length [see Note below]		x*	Max 16.2m***
	End-Dump Box Length	x	x	Max 14.65m
	Wheelbase (3)	x*	x	6.25 to 12.5m
	Kingpin Setback	x*	x	Max 2.0m radius
	Effective rear overhang (including load) (4)	x*	x	Max 35% of Wheelbase
	Tridem Spread	x*	x	3.0 to 3.1m
	Self-Steer ahead of Tridem (6)	x*	x	> 2.5 to 2.8m
	Self-Steer Dual spread	x*	x	1.2 to 1.4m
	Track Width if trailer > 2.5m wide	x*	x	2.5 to 2.6m
Inter-Axle	Single to Tandem (2)	x*	x	Min 3.0m
	Tandem to Self-Steer (5)	x*	x	Min 4.8m

Tire Weights	Width < 150 mm as marked on tire	x	x	Max 9 kg/mm
	Width 150 mm or more as marked on tire	x*	x	Max 11 kg/mm or 3,850 kg
Axle Weights	Steering Axle > 5,000 kg	x*	x	Max GAWR or 7,700 kg
	Tandem Drives: 1.2 < 1.6m	x	x	Max 18,000 kg
(Dual tires needed if	1.6 < 1.7m	x	x	Max 18,300 kg
tandem > 15,400 kg)	1.7 < 1.8m	x	x	Max 18,700 kg
	1.8m or more	x	x	Max 19,100 kg
	Tridem Axle: 3.0 to 3.1m	x*	x	Max 22,500 kg
	Each Self-Steer Axle	x*	x	1/3 weight on Tridem
Typical GVW**				
8 Axles	6,000 + 18,000 + 7,500 + 7,500 + 22,500	x	x	61,500 kg
	** Also check Gross Weight Table 29			

Notes:
- 'Short' means semi-trailer is 14.65m or less;
- 'Long' means semi-trailer length is more than 14.65m;
- 'x' indicates that item is controlled;
- * Indicates Phase 3 proposed change from rules that would normally apply;
- ** Use actual (scaled) front axle weight in GVW calculation up to maximum allowed;
- *** Including any auxiliary equipment or machinery at back of trailer;
- Forward self-steer axle must turn at least 25° in either direction, rear self-steer axle at least 20°;
- Five trailer axles must automatically load-equalize;
- If self-steer axles are liftable, there is no cab control. May operate with forward axle raised or both axles raised. When forward axle is lifted, vehicle meets SPIF #3 rules. When both axles are raised, vehicle meets SPIF #1 rules;
- May have automatic lift controls that activate when the vehicle is reversing;
- Has a device, or device plus chart, which accurately displays total kilograms on trailer axles;
- Trailer has original compliance label. The notation "Reg 597(Ont)-5" shows on trailer compliance label or ID plate signifying approved facility has manufactured or retrofitted the trailer to specifications.

SPIF Vehicle #6
Tri-Drive Tractor Fixed Axle Semi-Trailer



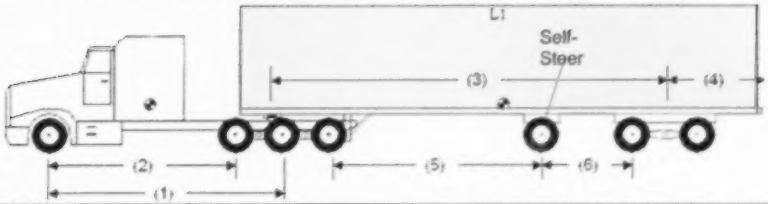
Item	Dimension / Weight		Short*	Long*	Limit
Overall	Length		x*	x*	Max 23.5m
	Width		x	x	Max 2.6m
	Height		x	x	Max 4.15m
	Non-deployed lift-axles allowed (semi-trailer only)		x	x	no limit
Tractor	Wheelbase (1)		x*	x	6.6 to 6.8m
	Steering Axle Allowed		x*	x	Single Axle / Single Tires
	Drive Axles Allowed		x*	x	Tridem (3 axles drive)
	Tridem Spread		x*	x	2.4 to 2.8m
	Tri-drive Track Width		x*	x	2.5 to 2.6m
Semi-Trailer	Length	[see Note below]	x		Max 14.65m
	Length	[see Note below]		x*	Max 16.2m***
	End-Dump Box Length		x	x	max 14.65m
	Wheelbase (3)		x*	x	6.25 to 12.0m
	Kingpin Setback		x*	x	Max 2.0m radius
	Effective rear overhang (including load) (4)		x*	x	Max 35% of wheelbase
	Axle Groups Allowed		x*	x	Single, Tandem, Tridem
	Tandem Spread		x*	x*	1.2 to 2.8m
	Tridem Spread		x*	x	2.4 to 3.7m
	Track Width if trailer > 2.5m wide		x*	x	2.5 to 2.6m
Inter-Axle	Single to Tridem (2) (5)		x*	x	Min 3.0m
	Tandem to Tridem (5)		x*	x	Min 5.5m
	Tridem to Tridem (5)		x*	x	Min 6.0m

Tire Weights	Width < 150 mm as marked on tire		x	x	Max 9 kg/mm
	Width 150 mm or more as marked on tire		x*	x	Max 11 kg/mm or 3,850 kg
Axle Weights	Steering Axle > 5,000 kg		x*	x	Max GAWR or 7,700 kg
	Steering Axle Minimum at all times		x*	x	Min 27% of Tri-drive weight
	Tri-drive Axle:	2.4 to 2.8m	x*	x	Max 21,300 kg
(Dual tires needed if:	Single Axle:		x	x	Max 10,000 kg
- single axle > 7,700 kg	Tandem Axle:	1.2 < 1.6m	x*	x	Max 18,000 kg
- tandem > 15,400 kg		1.6 < 1.7m	x	x	Max 18,300 kg
- tridem > 23,100 kg)		1.7 < 1.8m	x	x	Max 18, 700 kg
		1.8m or more	x	x	Max 19,100 kg
	Tridem Axle:	2.4 < 3.0m	x	x	HTA Table 2
		3.0 < 3.6m (until 2006)	x	x	HTA Table 2
		3.0 < 3.6m (2006)	x*	x	Max 24,000 kg
		3.6 to 3.7m (until 2006)	x*	x	Max 25,500 kg
		3.6 to 3.7m (2006)	x*	x	Max 26,000 kg
Typical GVW**					
5 Axles	6,000 + 21,300 + 10,000		x	x	37,300 kg
6 Axles	6,000 + 21,300 + 19,100		x	x	46,400 kg
7 Axles	6,000 + 21,300 + 25,500		x	x	52,800 kg
	** Also check Gross Weight Tables 6 - 22				

Notes:
- 'Short' means semi-trailer is 14.65m or less;
- 'Long' means semi-trailer length is more than 14.65m;
- 'x' indicates that item is controlled;
- * Indicates Phase 3 proposed change from rules that would normally apply;
- ** Use actual (scaled) front axle weight in GVW calculation up to maximum allowed;
- *** Including any auxiliary equipment or machinery at back of trailer;
- Any drive axle locking device must be unlocked while operating on a highway.

SPIF Vehicle #7

Tri-Drive Tractor Self-Steer Triaxle Semi-Trailer

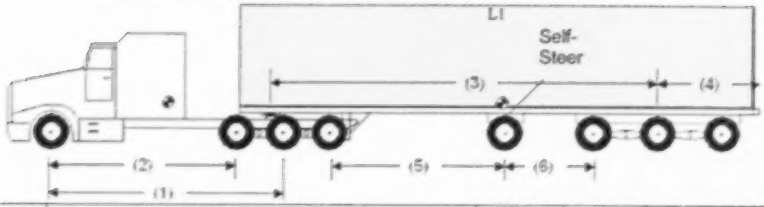


Item	Dimension / Weight	Short*	Long*	Limit
Overall	Length	x*	x*	Max 23.5m
	Width	x	x	Max 2.6m
	Height	x	x	Max 4.15m
	Non-deployed lift axles allowed (semi-trailer only)	x	x	no limit
Tractor	Wheelbase (1)	x*	x	6.6 to 6.8m
	Steering Axle Allowed	x*	x	Single Axle / Single Tires
	Drive Axles Allowed	x*	x	Tridem (3 axles drive)
	Tridem Spread	x*	x	2.4 to 2.8m
	Tri-drive Track Width	x*	x	2.5 to 2.6m
Semi-Trailer	Length [see Note below]	x		Max 14.65m
	Length [see Note below]		x*	Max 16.2m***
	End-Dump Box Length	x	x	Max 14.65m
	Wheelbase (3)	x*	x	6.25 to 12.0m
	Kingpin Setback	x*	x	Max 2.0m radius
	Effective rear overhang (including load) (4)	x	x	Max 35% of wheelbase
	Tandem Spread ****	x*	x	1.2 to 2.8m
	Self-Steer ahead of Tandem (6)	x	x	>2.5 to 3.0m
	Track Width if trailer > 2.5m wide	x*	x	2.5 to 2.6m
Inter-Axle	Single to Tridem (2) (5)	x*	x	Min 3.0m

Tire Weights	Width < 150 mm as marked on tire	x	x	Max 9 kg/mm
	Width 150 mm or more as marked on tire	x*	x	Max 11 kg/mm or 3,850 kg
	Self-Steer Axle single tire 150 mm or more	x	x	Max 11 kg/mm or 4,500 kg
Axle Weights	Steering Axle > 5,000 kg	x*	x	Max GAWR or 7,700 kg
	Steering Axle Minimum at all times	x*	x	Min 27% of Tri-drive weight
	Tri-drive Axle: 2.4 to 2.8m	x*	x	Max 21,300 kg
(Dual tires needed if:	Tandem Axle: 1.2 < 1.6m	x	x	Max 18,000 kg
- tandem > 15,400 kg	1.6 < 1.7m	x	x	Max 18,300 kg
- self-steer > 9,000 kg)	1.7 < 1.8m	x	x	Max 18,700 kg
	1.8m or more	x	x	Max 19,100 kg
	Self-Steer Axle	x	x	½ weight on Tandem
Typical GVW**				
7 Axles	6,000 + 21,300 + 9,000 + 18,000	x	x	54,300 kg
7 Axles	6,000 + 21,300 + 9,550 + 19,100	x	x	55,950 kg
	** Also check Gross Weight Tables 16 - 22			

Notes:
- 'Short' means semi-trailer is 14.65m or less;
- 'Long' means semi-trailer length is more than 14.65m;
- 'x' Indicates that item is controlled;
- * Indicates Phase 3 proposed change from rules that would normally apply;
- ** Use actual (scaled) front axle weight in GVW calculation up to maximum allowed;
- *** Including any auxiliary equipment or machinery at back of trailer;
- **** if tandem spread > 1.85m, self-steer axle is equipped with a device to lock axle in straight ahead position at highway speed (tbd);
- Self-steer axle must turn at least 20° in either direction;
- Three trailer axles must automatically load-equalize;
- if self-steer axle is liftable, there is no cab control. When lifted, vehicle meets SPIF #6 rules;
- May have automatic lift controls that activate when the vehicle is reversing;
- Trailer has original compliance label. The notation "Reg 597(Ont)-3" shows on the trailer compliance label or ID plate signifying approved facility has manufactured or retrofitted the trailer to specifications;
- Any drive axle locking device must be unlocked while operating on a highway.

SPIF Vehicle #8
Tri-Drive Tractor Self-Steer Quad Semi-Trailer

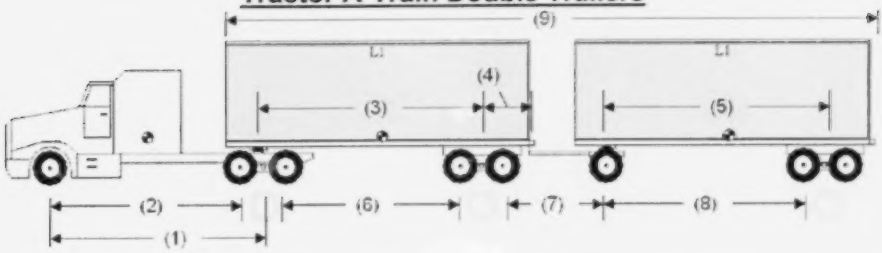


Item	Dimension / Weight	Short*	Long*	Limit
Overall	Length	x*	x*	Max 23.5m
	Width	x	x	Max 2.6m
	Height	x	x	Max 4.15m
	Non-deployed lift-axles allowed (semi-trailer only)	x*	x	no limit
Tractor	Wheelbase (1)	x*	x	6.6 to 6.8m
	Steering Axle Allowed	x*	x	Single Axle / Single Tires
	Drive Axles Allowed	x*	x	Tridem (3 axles drive)
	Tridem Spread	x*	x	2.4 to 2.8m
	Tri-drive Track Width	x*	x	2.5 to 2.6m
Semi-Trailer	Length [see Note below]	x		Max 14.65m
	Length [see Note below]		x*	Max 16.2m***
	End-Dump Box Length	x	x	Max 14.65m
	Wheelbase (3)	x*	x	6.25 to 12.0m
	Kingpin Setback	x*	x	Max 2.0m radius
	Effective rear overhang (including load) (4)	x	x	Max 35% of wheelbase
	Tridem Spread	x	x	3.0 to 3.7m
	Self-Steer ahead of Tridem (6)	x	x	>2.5 to 3.0m
	Track Width if trailer > 2.5m wide	x*	x	2.5 to 2.6m
Inter-Axle	Single to Tridem (2)	x*	x	Min 3.0m
	If Tridem spread is 3.0 < 3.6m (5)	x*	x	Min 5.0m
	If Tridem spread is 3.6 to 3.7m (5)	x*	x	Min 4.5m

Tire Weights	Width < 150 mm as marked on tire	x	x	Max 9 kg/mm
	Width 150 mm or more as marked on tire	x*	x	Max 11 kg/mm or 3,850 kg
	Self-Steer Axle single tire (365 < 385 mm width)	x	x	Max 4,000 kg
	Self-Steer Axle single tire (385 mm or more)	x	x	Max 4,250 kg
Axle Weights	Steering Axle > 5,000 kg	x*	x	Max GAWR or 7,700 kg
	Steering Axle Minimum at all times	x*	x	Min 27% of Tri-drive weight
(Dual tires needed if:	Tri-drive Axle: 2.4 to 2.8m	x	x	Max 21,300 kg
- tridem > 23,100 kg)	Tridem Axle: 3.0 < 3.6m	x	x	Max 24,000 kg
	3.6 to 3.7	x	x	Max 25,500 kg
	Self-Steer Axle	x	x	1/3 weight on Tridem
Typical GVW**				
8 Axles	6,000 + 21,300 + 8,000 + 24,000	x	x	59,300 kg
8 Axles	6,000 + 21,300 + 8,500 + 25,500	x	x	61,300 kg
	** Also check Gross Weight Table 29			

Notes:
- 'Short' means semi-trailer is 14.65m or less;
- 'Long' means semi-trailer length is more than 14.65m;
- 'x' indicates that item is controlled;
- * Indicates Phase 3 proposed change from rules that would normally apply;
- ** Use actual (scaled) front axle weight in GVW calculation up to maximum allowed;
- *** Including any auxiliary equipment or machinery at back of trailer;
- Self-steer axle must turn at least 20° in either direction;
- Four trailer axles must automatically load-equalize;
- If self-steer axle is liftable, there is no cab control. When lifted, vehicle meets SPIF #6 rules;
- May have automatic lift controls that activate when the vehicle is reversing;
- Has a device, or device plus chart, which accurately displays total kilograms on trailer axles;
- Trailer has original compliance label. The notation "Reg 597(Ont)-4 shows on the trailer compliance label or ID plate signifying approved facility has manufactured or retrofitted the trailer to specifications;
- Any drive axle locking device must be unlocked while operating on a highway.

SPIF Vehicle #9
Tractor A-Train Double Trailers

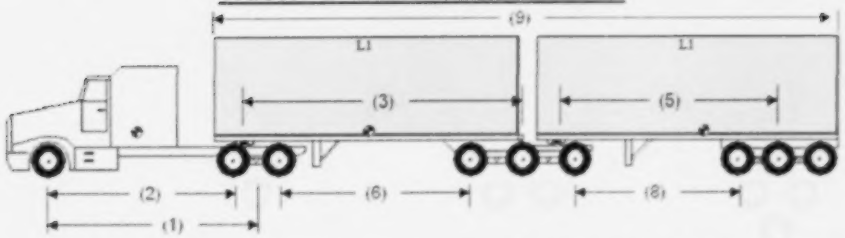


Item	Dimension / Weight		Short	Long	Limit
Overall	Length	[see Note below]	x		Max 23.0m
	Length	[see Note below]		x	Max 25.0m
	Box Length (9)	[see Note below]	x		Max 18.5m
	Box Length (9)	[see Note below]		x*	Max 20.0m
	Width		x	x	Max 2.6m
	Height		x	x	Max 4.15m
	Non-deployed lift-axles allowed (trailers only)		x	x*	no limit
Tractor	Wheelbase (1)			x	Max 6.2m
	Wheelbase (1) 2006+ tractor model year		x*		Max 6.2m
	Steering Axle Allowed		x*	x	Single Axle / Single Tires
	Drive Axles Allowed		x*	x	Single or Tandem
	Tandem Spread		x*	x	1.2 to 1.85m
Lead Semi-Trailer	Wheelbase (3)		x*	x	Min 6.25m
	Kingpin Setback		x*	x	Max 2.0m radius
	Hitch Offset (4)		x*	x	Max 1.8m
	Axle Groups Allowed		x*	x	Single or Tandem
	Tandem Spread		x*	x	1.2 to 1.85m
	Track Width if trailer > 2.5m wide		x*	x	2.5 to 2.6m
Second Semi or Full Trailer	Wheelbase (5)		x*	x	Min 6.25m
	Axle Groups Allowed (front axle or dolly)		x*	x	Single
	Axle Groups Allowed (rear axle)		x*	x	Single or Tandem
	Tandem Spread		x*	x	1.2 to 1.85m
	Track Width if trailer > 2.5m wide		x*	x	2.5 to 2.6m
Inter-Axle	Single to Single or Tandem (2) (6) (8)		x*	x	Min 3.0m
	Tandem to Tandem (6)		x*	x	Min 5.0m
	Dimension "A" (7)				not controlled

Tire Weights	Width < 150 mm as marked on tire	x	x	Max 9 kg/mm
	Width 150 mm or more as marked on tire	x*	x*	Max 11 kg/mm or 3,850 kg
Axle Weights	Steering Axle > 5,000 kg	x*	x*	Max GAWR or 7,700 kg
	Single Axle:	x	x	Max 10,000 kg
(Dual tires needed if	Tandem Axles: 1.2 < 1.6m	x*	x*	Max 18,000 kg
- single axle > 7,700 kg	1.6 < 1.7m	x	x	Max 18,300 kg
- tandem > 15,400 kg)	1.7 < 1.8m	x	x	Max 18,700 kg
	1.8m or more	x	x	Max 19,100 kg
Typical GVW**				
5 Axles	5,000 + 10,000 + 10,000 + 10,000 + 10,000	x*	x	41,900 kg Cap
6 Axles	5,400 + 18,000 + 10,000 + 10,000 + 10,000	x*	x	49,800 kg Cap
7 Axles	5,400 + 18,000 + 18,000 + 10,000 + 10,000	x*	x	53,500 kg Cap
8 Axles	5,400 + 18,000 + 18,000 + 10,000 + 18,000	x*	x	53,500 kg Cap
	** Also check Gross Weight Tables 3 - 29			

Notes:
- 'Short' means overall length is 23.0m or less and box length is 18.5m or less;
- 'Long' means overall length is more than 23.0m or box length exceeds 18.5m;
- 'x' indicates that item is controlled;
- * Indicates Phase 3 proposed change from rules that would normally apply;
- ** Use actual (scaled) front axle weight in GVW calculation up to 5,499 kg;
- ** For Gross Weight Tables, Inter-Vehicle Unit Distance is lower of (6) or (7) in diagram;
- Gross weight of second trailer must not exceed weight on drive axles plus first trailer axles.

SPIF Vehicle #10
Tractor B-Train Double Trailers

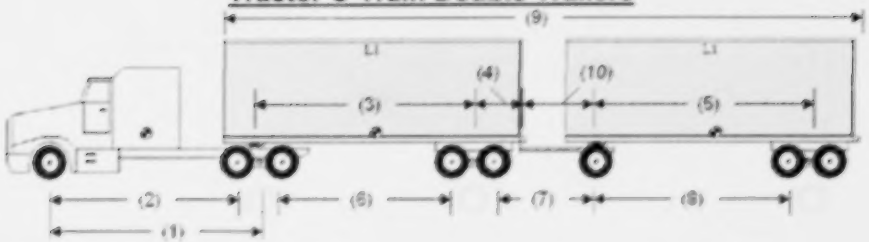


Item	Dimension / Weight		Short	Long	Limit
Overall	Length	[see Note below]	x		Max 23.0m
	Length	[see Note below]		x	Max 25.0m
	Box Length (9)	[see Note below]	x		Max 18.5m
	Box Length (9)	[see Note below]		x	Max 20.0m
	Width		x	x	Max 2.6m
	Height		x	x	Max 4.15m
	Non-deployed lift-axles allowed (trailers only)		x	x*	no limit
Tractor	Wheelbase (1)			x	Max 6.2m
	Wheelbase (1) 2006+ tractor model year		x*		Max 6.2m
	Steering Axle Allowed		x*	x	Single Axle / Single Tires
	Drive Axles Allowed		x*	x	Single or Tandem
	Tandem Spread		x*	x	1.2 to 1.85m
Each Semi-Trailer	Wheelbase (3) (5)		x*	x	Min 6.25m
	Sum of Wheelbases (3) + (5)		x*	x	Max 17.0m
	Kingpin Setback (Each Trailer)		x*	x*	Max 2.0m radius
	Kingpin behind last axle (Second Trailer)		x*	x	Max 0.3m
	Axle Groups Allowed (Lead Trailer)		x*	x	Tandem or Tridem
	Axle Groups Allowed (Second Trailer)		x*	x	Single, Tandem, Tridem
	Tandem Spread		x*	x	1.2 to 1.85m
	Tridem Spread		x*	x	2.4 to 3.1m
	Track Width if trailer > 2.5m wide		x*	x	2.5 to 2.6m
Inter-Axle	Single to Single, Tandem or Tridem (2) (6) (8)		x*	x	Min 3.0m
	Tandem to Tandem (6) (8)		x*	x	Min 5.0m
	Tandem to Tridem (6) (8)		x*	x	Min 5.5m
	Tridem to Tridem (8)		x*	x	Min 6.0m

Tire Weights	Width < 150 mm as marked on tire		x	x	Max 9 kg/mm
	Width 150 mm or more as marked on tire		x*	x*	Max 11 kg/mm or 3,850 kg
Axle Weights	Steering Axle > 5,000 kg		x*	x*	Max GAWR or 7,700 kg
	Single Axle:		x	x	Max 10,000 kg
(Dual tires needed if:	Tandem Axles:	< 1.6m	x*	x*	Max 18,000 kg
- single axle > 7,700 kg		1.6 < 1.7m	x	x	Max 18,300 kg
- tandem > 15,400 kg		1.7 < 1.8m	x	x	Max 18,700 kg
- tridem > 23,100 kg)		1.8m or more	x	x	Max 19,100 kg
	Tridem Axles:	2.4 < 2.8m	x	x	Max 21,300 kg
		2.8 < 2.9m	x	x	Max 21,700 kg
		2.9 < 3.0m	x	x	Max 22,000 kg
		3.0 to 3.1m (until 2006)	x	x	Max 23,000 kg
		3.0 to 3.1m (2006)	x*	x*	Max 24,000 kg
Typical GVW**					
5 Axles	5,000 + 10,000 + 18,000 + 10,000		x	x	43,000 kg
6 Axles	5,400 + 18,000 + 18,000 + 10,000		x	x	51,400 kg
7 Axles	5,400 + 18,000 + 19,100 + 18,000		x*	x	60,300 kg Cap
8 Axles	5,400 + 18,000 + 23,000 + 18,000		x*	x	63,500 kg Cap
9 Axles	5,400 + 18,000 + 21,300 + 21,300		x*	x	63,500 kg Cap
	** Also check Gross Weight Tables 6-15, A, B				

Notes: - 'Short' means overall length is 23.0m or less and box length is 18.5m or less;
- 'Long' means overall length is more than 23.0m or box length exceeds 18.5m;
- 'x' indicates that item is controlled;
- * Indicates Phase 3 proposed change from rules that would normally apply;
- ** Use actual (scaled) front axle weight in GVW calculation up to maximum allowed. Use Tables A or B for all 7 to 9 axle configurations.

SPIF Vehicle #11
Tractor C-Train Double Trailers



Item	Dimension / Weight		Short	Long	Limit
Overall	Length	[see Note below]	x		Max 23.0m
	Length	[see Note below]		x	Max 25.0m
	Box Length (9)	[see Note below]	x		Max 18.5m
	Box Length (9)	[see Note below]		x	Max 20.0m
	Width		x	x	Max 2.6m
	Height		x	x	Max 4.15m
	Non-deployed lift axles allowed (trailers only)		x	x*	no limit
Tractor	Wheelbase (1)			x	Max 6.2m
	Wheelbase (1) 2006+ tractor model year		x*		Max 6.2m
	Steering Axle Allowed		x*	x	Single Axle / Single Tires
	Drive Axles Allowed		x*	x	Single or Tandem
	Tandem Spread		x*	x	1.2 to 1.85m
Each Semi-Trailer	Wheelbase (3)		x*	x	Min 6.25m
	Kingpin Setback (lead trailer only)		x*	x	Max 2.0m radius
	Hitch Offset (4)		x*	x	Max 1.8m
	Axle Groups Allowed		x*	x	Single or Tandem
	Tandem Spread		x*	x	1.2 to 1.85m
	Track Width if trailer > 2.5m wide		x*	x	2.5 to 2.6m
C Dolly	Drawbar Length (10)		x*	x	Max 2.0m
	Axle Groups Allowed		x*	x	Single
	Track Width if rear trailer > 2.5m wide		x*	x	2.5 to 2.6m
Inter-Axle	Single to Single or Tandem (2) (6) (8)		x*	x	Min 3.0m
	Tandem to Tandem (6)		x*	x	Min 5.0m
	Dimension "A" (7)				not controlled

Tire Weights	Width < 150 mm as marked on tire	x	x	Max 9 kg/mm
	Width 150 mm or more as marked on tire	x*	x*	Max 11 kg/mm or 3,850 kg
Axle Weights	Steering Axle > 5,000 kg	x*	x*	Max GAWR or 7,700 kg
	Single Axle	x	x	Max 10,000 kg
(Dual tires needed if:	Tandem Axles: 1.2 < 1.6m	x*	x*	Max 18,000 kg
- single axle > 7,700 kg	1.6 < 1.7m	x	x	Max 18,300 kg
- tandem > 15,400 kg)	1.7 < 1.8m	x	x	Max 18,700 kg
	1.8m or more	x	x	Max 19,100 kg
	Tandem Axle of Lead Trailer + Dolly (combined)	x*	x	Max 23,000 kg
Typical GVW**				
5 Axles	5,000 + 10,000 + 10,000 + 10,000 + 10,000	x*	x	41,900 kg Cap
6 Axles	5,400 + 18,000 + 10,000 + 10,000 + 10,000	x*	x	49,800 kg Cap
7 Axles	5,400 + 18,000 + 15,000 + 8,000 + 10,000	x*	x	54,600 kg Cap
8 Axles	5,400 + 18,000 + 15,000 + 8,000 + 18,000	x*	x	58,500 kg Cap
	** Also check Gross Weight Tables 3 - 29			

Notes:
- 'Short' means overall length is 23.0m or less and box length is 18.5m or less;
- 'Long' means overall length is more than 23.0m or box length exceeds 18.5m;
- 'x' indicates that item is controlled;
- * Indicates Phase 3 proposed change from rules that would normally apply;
- ** Use actual (scaled) front axle weight in GVW calculation up to 5,499 kg;
- ** For Gross Weight Tables, Inter-Vehicle Unit Distance is lower of (6) or (7) in diagram;
- The weight on dolly axle plus second trailer axles must not exceed weight on drive axles plus first trailer axles;
- C-Dolly and Hitch must meet *Motor Vehicle Safety Act* Sections 903 and 904.